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The Commonwealth of Massachusetts

ANNUAL REPORT

1937-1947

OF THE

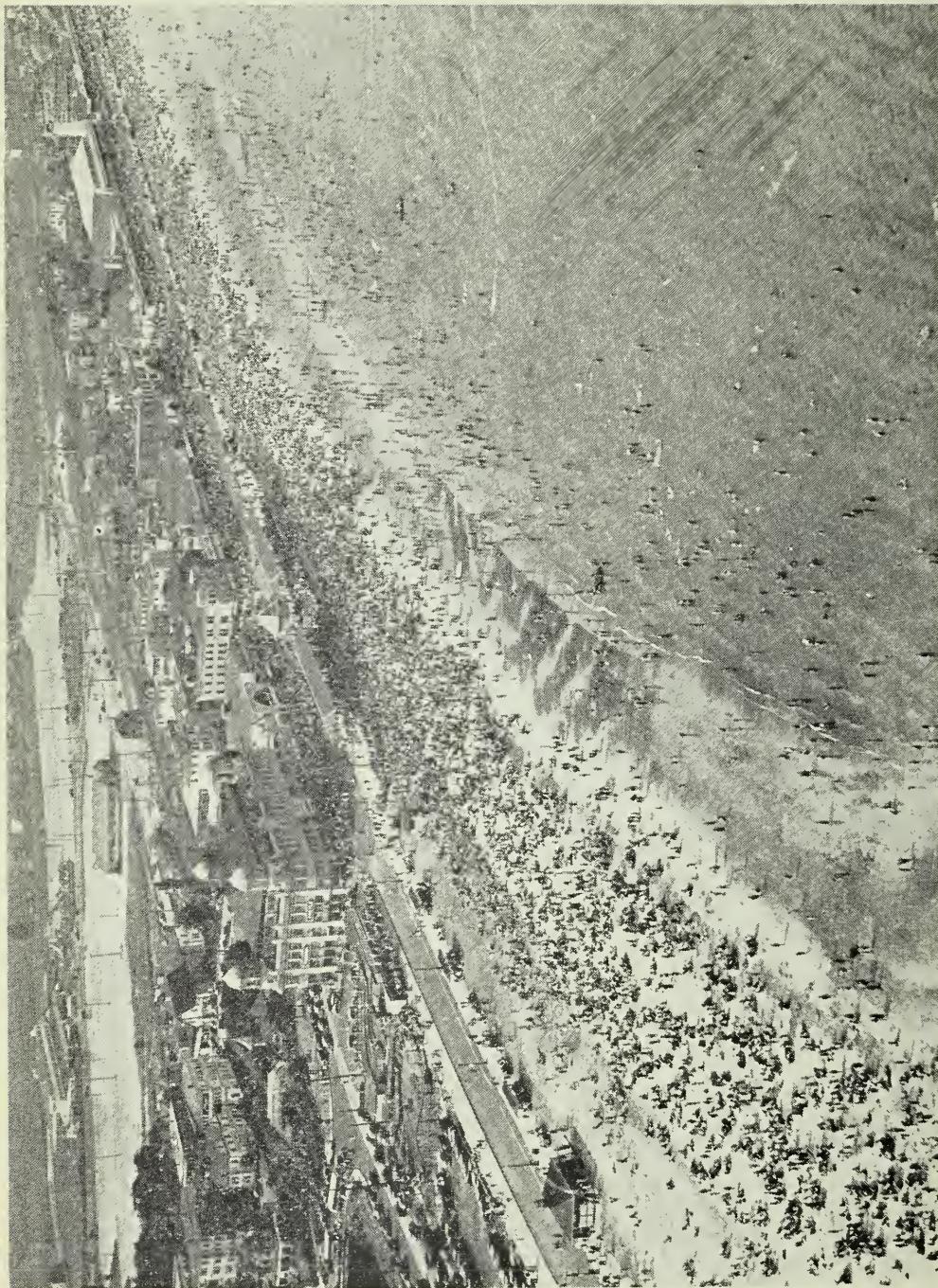
METROPOLITAN DISTRICT COMMISSION

FOR THE YEAR 1937



PUBLICATION OF THIS DOCUMENT APPROVED BY THE COMMISSION ON ADMINISTRATION AND FINANCE

1m-3-'38. No. 3412.



Courtesy the Boston Post

REVERE BEACH

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REPORT OF THE METROPOLITAN DISTRICT COMMISSION

TO THE HONORABLE THE SENATE AND HOUSE OF
REPRESENTATIVES OF THE COMMONWEALTH OF
MASSACHUSETTS IN GENERAL COURT ASSEMBLED.

The Metropolitan District Commission has already presented to your Honorable Body an abstract of the account of the receipts, expenditures, disbursements and liabilities of the Metropolitan District Commission for the fiscal year ending on November 30, 1937, and now, in accordance with the provisions of section 100 of chapter 92 of the General Laws, presents a detailed statement of its doings for the calendar year ending on December 31, 1937.

EIGHTEENTH ANNUAL REPORT

I. Organization and Administration

COMMISSION, OFFICERS AND EMPLOYEES

The Commission remains the same as in the previous year, Eugene C. Hultman, Commissioner, William F. Rogers, Melvin B. Breath, Felix A. Marcella and Austin J. O'Connor, Associate Commissioners. William F. Rogers was re-appointed as Associate Commissioner on December 8, 1937 for a term of five years.

William E. Whittaker has continued as Secretary of the Commission, William E. Foss as Director and Chief Engineer of the Water Division, Benjamin R. Davis as Director and Chief Engineer of Park Engineering and Joseph P. Dever as Director and Chief Engineer of the Sewer Division.

The total number of permanent positions as of November 30, 1937 and the number of temporary employees during the year is divided as follows:

	Administration	Parks Division	Sewerage Division	Water Division	Total
Permanent	44	676	229*	374	1,323
Temporary	25	602	358**	111	1,096
	69	1,278	587	485	2,419

*Of this number 14 employees worked part time on Massachusetts State Project D-101, P.W.A. Docket 1098-R, Sewerage Division.

**Of this number 78 employees worked on Massachusetts State Project D-101, P.W.A. Docket 1098-R, Sewerage Division.

II. General Financial Statement

Year ending November 30, 1937

Expended for construction	\$1,872,864.66*
Expended for maintenance	4,160,070.42
Expended for miscellaneous	20,576.13
Total expenditures	6,053,511.21
Unexpended balance, maintenance appropriations	573,544.11
Serial bonds and notes issued	35,000.00
Sinking fund bonds paid	1,900,000.00
Serial bonds and notes paid	503,437.50
Decrease in sinking fund	215,755.27
Decrease in net debt	2,584,192.77

On November 30, 1937

Net debt \$15,005,905.29

*Of this amount \$25,679.03 is for Massachusetts State Project D-1, Docket 4478, Wellington Bridge.

Of this amount \$1,224,086.59 is for Metropolitan Sewerage Construction Fund, North System, Massachusetts State Project D-101, Docket 1098-R.

III. Parks Division—Construction

During the year of 1937, plans and specifications were prepared and construction supervised on the following jobs performed by contract or by the maintenance forces of the various divisions:

Alewife Brook Parkway

The bridge over the Central Massachusetts Branch and the bridge over the Fitchburg Division of the Boston and Maine Railroad, in Cambridge, were painted.

Repairs were made to the Hill Road Bridge in Belmont.

A contract was awarded and work started, for furnishing and installing lighting standards with concrete bases, also cables, ducts, manholes, fixtures, transformers, etc., on the Alewife Brook Parkway in Cambridge from the junction of Alewife Brook Parkway and Concord Turnpike to Concord Avenue.

Blue Hills Reservation

The Blue Hill River Bridge in Braintree was repaired.

Bunker Hill Reservation

Painting of the interior of the Administration Building at the Bunker Hill Monument, Charlestown.

Charles River Reservation

At Harvard Bridge, Boston and Cambridge, the granite block paving was repaired, decking bolts were renewed and angle irons were rebolted at the expansion joints.

Two lamp posts were installed at the Larz Anderson Bridge, to replace two damaged ones. The lamps on the John W. Weeks Bridge in Boston and Cambridge were repaired.

The steps at the comfort station on the Charles River Embankment, Boston, were reconstructed and the plumbing and plumbing fixtures were renewed.

Labor, materials and equipment were furnished for removing, transporting and storing the wood covering on the acoustical music shell on the Storrow Memorial Embankment, and also for cleaning, repairing and painting both wooden and steel parts of the shell.

Borings were made at the Charles River Dam at the site of the stop plankhouse, and at the Charles River Embankment at the site of the proposed recreation building. A contract was awarded for the construction of the stop plank house and garage and the work will be completed in 1938.

The main water line was relaid to the sanitary on the Storrow Memorial Embankment.

A contract was awarded for the redecking of the upstream leaf and improvements to the locking devices. The work was in progress at the end of the year.

A bathing beach was constructed at the southerly side of Pleasant Street about 700 feet east of Green Street, on the Charles River in Watertown.

The westerly shore and ends of the breakwater at the boat haven opposite Pinckney Street in the Charles River Basin, Boston, were re-paved.

Repairs are being made to the Moody Street Dam on the Charles River in Waltham.

Furnace Brook Parkway

The bridge carrying the tracks of the New York, New Haven and Hartford Railroad at Newport Avenue, Quincy, was painted.

Hammond Pond Parkway

The blast plates under the bridge over the Highland Branch of the Boston and Albany Railroad, Newton, were painted.

Hemlock Gorge Reservation

Sluice gates were being installed at the Boylston Street Bridge, Hemlock Gorge Reservation, Newton, at the end of the year.

Lynn Shore Reservation

Repairs were made to the sea wall, steps and sidewalk along Lynn Shore Reservation from Washington Street, Lynn to Humphrey Street, Swampscott.

Middlesex Fells Parkway

A contract was awarded for drainage improvements and the installation of a tide gate at the junction of Middlesex Fells Parkway and Mystic Valley Parkway in Medford. The work will be completed early in 1938.

Repairs were made to the Medford Branch Bridge of the Boston and Maine Railroad in Medford.

Middlesex Fells Reservation

Surface water drains, manholes, drop inlets, etc., were constructed at Hillcrest Parkway, Winchester.

The buildings and fences at the Pond Street Headquarters, Stoneham, were cleaned and painted by contract.

Mystic River Reservation

The High Street Bridge and approaches between High Street, Medford and Medford Street, Arlington, which was authorized by Chapter 377 of the Acts of 1936, was completed and opened to traffic.

Bronze tablets were furnished and erected on three bridges over the Mystic River in Arlington, Medford and Somerville.

As authorized by Chapter 432 of the Acts of 1937, a contract was awarded for the construction of a bridge and approaches over the Mystic River at Harvard Avenue, Medford and River Street, Arlington. A separate contract was awarded for the building, maintaining and removing of a temporary bridge and approaches at the same location.

A contract was awarded for repairs to the lock gates at Cradock Dam, Medford. Another contract was awarded for the pointing of rubble masonry wall along the banks of the Mystic River at the dam.

Mystic Valley Parkway

Minor repairs were made at the Mystic River Bridge in Medford, and the Aberjona River Bridge in Winchester was repaired.

A contract was awarded for the installation of lighting standards and concrete bases along the Mystic Valley Parkway in Medford and Winchester, and work was in progress at the end of the year.

A contract was awarded for the reconstruction of Mystic Valley Parkway from Main Street to Mystic Avenue, Medford, which will be completed in 1938.

Nahant Beach Parkway

A sewer drain was installed from the "Waves" Concession to connect with the Lynn sewer near Nahant Beach Bath House.

Nantasket Beach Reservation

The area in back of the sea wall at Nantasket Beach Reservation near Water Street, Nantasket, was filled.

The boilers at Nantasket Beach Reservation, Hull, were being renewed at the end of the year.

A contract was awarded for the replacing and extending of a sewer at Nantasket Beach Reservation, Hull.

Old Colony Parkway

The Malibu Beach Bath House at Savin Hill Basin, Dorchester, which was authorized by Chapter 147 of the Acts of 1936, was completed and opened to the public on August 13, 1937.

Water pipe, electrical power cables and incidental equipment were installed for services to bath house. A six-foot steel picket fence was constructed along the sides of Old Colony Parkway and a three-foot steel fence around the bath house. Cement walks and loam areas were also constructed at the bath house.

Maintenance repairs were made to the draw floor, expansion joint and sidewalk of the Dorchester Bay Bridge. At the end of the year, work was in progress on the installation of traffic control signals, signs and lines for the bridge.

Emergency repairs were made to eight track supports under the draw of the Neponset River Bridge, Boston and Quincy, and to the submarine cable, draw floor and fender pier.

The Popes Hill Bridge was repaired.

Traffic control signals, signs and lines were being installed at the end of the year on Old Colony Parkway at Fox Point Road, Boston.

Quincy Shore Reservation

The sea wall and steps along Quincy Shore Reservation were reconstructed from Milton Road to Earle Road, Quincy.

Revere Beach Parkway

At the Broadway Overpass on the Revere Beach Parkway, Revere, the southerly slope to the southerly roadway was graded; trees, shrubs and vines were planted and cared for, and a watering system was installed.

Repairs were made to the southerly half of the Winthrop Avenue Bridge over the Boston and Maine Railroad, Revere Beach Parkway, Revere.

The bridge floor, draw and drawtender's house were repaired and sections of the north and south fender piers were replanked at the Malden River Bridge, Revere Beach Parkway, Medford and Everett.

Repairs were made to the Western Division Bridge of the Boston and Maine Railroad, Everett.

The north girder of the Beachmont Bridge over the Boston, Revere Beach and Lynn Railroad, Revere, was repaired.

Revere Beach Reservation

Contracts were awarded and work started on the construction of a sanitary building on Revere Beach Reservation at Oak Island, Revere, and for repairs to shelters and fence from Shirley Avenue to Oak Island Street, Revere.

Winthrop Shore Reservation

About four hundred tons of stone ballast shore protection were placed from the point opposite Charles Street, northerly, Winthrop Shore Reservation, Winthrop.

RECONSTRUCTION OF PARKWAYS AND BOULEVARDS

The following boulevards and parkways were reconstructed or resurfaced during the year, with some changes in grade and alignment:

Chickatawbut Road between Randolph Avenue and Granite Street, Quincy, Milton and Braintree, was resurfaced.

Soldiers Field Road from North Harvard Street northwesterly 2,600 feet, Charles River Reservation, Brighton, was reconstructed.

Furnace Brook Parkway from Adams Street to Willard Street, Quincy, was reconstructed.

Hammond Pond Parkway from the circle at Newton Street and Hammond Street to Heath Street, Brookline, was resurfaced.

The easterly roadway of Fellsway East from Highland Avenue to East Border Road, Middlesex Fells Parkway, and East Border Road to beyond Seery Street, Middlesex Fells Reservation in Malden, were reconstructed.

The westerly roadway of the Fellsway East from Highland Avenue to East Border Road, Middlesex Fells Parkway, was resurfaced and drain work installed on East Border Road, Middlesex Fells Reservation, in Malden.

Mystic Valley Parkway was reconstructed at Medford Street, Arlington and at High Street, Medford.

Mystic Valley Parkway, Arlington from Mystic Street, 1,455 feet northerly, was reconstructed.



Courtesy Fairchild Aerial Surveys, Inc.

MYSTIC VALLEY PARKWAY

The southerly corner of Waterfield Road at Mystic Valley Parkway, Winchester, was reconstructed.

The approaches of Dorchester Bay Bridge, Old Colony Parkway, in the Dorchester District of Boston, were reconstructed.

The easterly approach of the Neponset Bridge, Quincy, was resurfaced.

Quincy Shore Reservation from Fenno Street to Blacks Creek Bridge, Quincy, was reconstructed.

The northerly roadway of Revere Beach Parkway from Second Street to Everett Avenue, Everett, was reconstructed.

Two hundred and thirteen permits were issued for driveway entrances and other necessary purposes, and sixty-two orders concerning restrictions were issued and reported upon.

The Engineering Department has furnished the supervision of all driveway construction work and all other work relating to permits and has reported on building operations where violations of restrictions were involved.

The work of breaking ice in the channels of the Charles River Basin below Longfellow Bridge and in the Broad and Lechmere Canals was done as required by the Federal Government.

IV. Maintenance of Parks and Reservations

The usual work of maintenance of the parkways and boulevards and the reservations has continued during the year.

REVERE BEACH DIVISION

During the past year there was a large increase in the number of persons who visited the beaches in this division. This increase was due to the combination of an exceptionally warm summer, the reduction in carfare charges from outside cities and a growing appreciation of the benefits and pleasures to be derived from the facilities which are provided by the Commission for the public use. The added attendance at the beaches has resulted in a greater problem in keeping the beaches and roads clear of debris which is so carelessly scattered about. A large maintenance force is required during the summer months to provide this service.

Revere Beach Reservation:

Snow fences and basin markers were placed for the winter, snow was plowed and removed from the reservation and sanding done as required.

Parking lines for 1,111 automobiles were painted from Eliot Circle to the North Circle.

The boulevard was seal coated from Revere Street to North Circle.

Life boats and all life saving apparatus were overhauled, repaired, painted and put in serviceable condition.

The bath house building was kept in repair and the interior of the Police Station was painted.

The sewing room was removed from the Police Station to the bath house and the space thus cleared was made into a new guard and locker room to be used by police officers.

A new Solarium was installed in the bath yards of the bath house.

A telephone switch system was installed in the Police Station.

190 square yards of concrete were laid for garage floor.

56 square yards of concrete floor were laid in the lumber shed.

A catch basin was built and 100 feet of drain pipe laid for a new sanitary in the garage.

280 square yards of Tarvia sidewalk were placed on Chester Avenue.

95 square yards of concrete sidewalk were laid on the Boulevard at Revere Street.

Revere Beach Parkway:

300 linear feet of guard rail fence were erected on the Parkway from Main Street, Everett to the Boston and Maine Saugus Branch Bridge.

250 linear feet of guard rail fence were erected at Noonan's gravel pit on the parkway.

530 linear feet of guard rail fence were erected on the parkway near Slade's Mill.

100 linear feet of curbing were raised to grade and the roadway surface rebuilt on the Chelsea side of the Overpass where the road had settled.

400 trees and 3,900 shrubs were planted, sprayed and pruned.

The parkway and gutters were kept clean, basins cleaned and repaired, road patched and fences repaired and painted.

4 traffic lines have been painted from Middlesex Fells to Revere and warning signs repainted.

The parkway has been seal coated from Broadway to Mill Street, Revere.

700 cubic yards of loam were used in renewing grass areas and in constructing new grass areas.

Snow fences and basin markers were placed for the winter. Snow was removed and the roadways sanded. Boundary posts were installed.

A new tool crib of field stone was built at the Overpass in Revere.

Life saving equipment was inspected, repaired and painted at Slade's Mill.

185 cubic yards of loam were used in making a 100 feet x 50 feet (5,000 square feet) sod bed on the parkway, near Vinal Street, Revere.

Lynnway:

Grass plots were reloamed and seeded, catch basins cleaned, trees sprayed, fences painted, traffic lines and directional signs renewed, snow was removed and the roads sanded.

An area, 70 feet by 30 feet, at the approach to the General Edwards Bridge, was built up to grade, using 26 tons of Tarvia. Snow was removed and the bridge sanded.

95 square yards of concrete sidewalk were laid on Lynnway between Lancaster Avenue and Rice Avenue.

25½ tons Tarvia was placed in the extension of walks on the westerly side of Lynnway.

Lynn Shore Reservation:

Regular maintenance was done, such as the removal of debris from the beach and road, sidewalk repairs, cleaning of catch basins and sewer lines, care of shrubs and trees, spraying, fertilizing and care of grass.

Traffic lines and benches were painted.

A large spruce tree was moved from the home of Mrs. Killiam at 16 King Street, Lynn to Woodbury's Point. The tree was a gift of Mrs. Killiam who also gave the division a 60-foot flag pole and flag which was set up on the Seaside Park Play-ground.

55 trees, 850 bulbs and 610 plants were set out during the year.

100 cubic yards of loam were used to repair grass areas and shrub beds.

Nahant Beach Parkway:

The Promenade over the old bridle path from the Nahant Bath House to Little Nahant has been completed. It is 6,300 feet long and 10 feet wide.

A concrete retaining wall, 68 feet long, 18 inches deep and 6 inches wide, was built at the bath house for a new cement floor. A catch basin was built and 36 feet of drain pipe was laid to drain the new floor.

888 square feet of new concrete floor were laid.

A concrete retaining wall, 36 feet long, 2 feet deep and 8 inches wide, was built for the new Solarium in the bath house. A new concrete floor, 400 square feet in area, was laid in the Solarium.

270 linear feet of auto guard rail fence were erected at Seaside Park.

100 linear feet of guard rail fence was erected at Little Nahant.

A Telechron movement was installed in the outside clock on the bath house.

200 cubic yards of loam were used to recondition Seaside Playground.

An instructor from the Lynn Park Department was assigned to the Nahant Playground during the summer season. About 130,000 children used this area, and the public has shown great appreciation of the facilities furnished by the Commission.

Winthrop Parkway:

The beach, walks and road were cleaned and the sea wall was pointed. Snow was removed.

A toe wall was built at Beachmont, 25 feet long, $5\frac{1}{2}$ feet deep and $2\frac{1}{2}$ feet wide. A derrick was used at Beachmont to replace rip rap that had been displaced by the tide.

564 linear feet of fence were erected on Endicott Avenue, Revere.

Winthrop Shore Reservation:

24 stairs were provided to reach the beach.

The sea wall was pointed and the road and walks patched.

The beach and road were cleaned, snow removed and the road sanded.

MIDDLESEX FELLS DIVISION

Middlesex Fells Reservation:

The bridle paths were kept in good repair; the recreation grounds and parking spaces kept free of debris and wood was supplied for the fireplaces at the Sheepfold. The land adjoining the house owned by the Commission near the Fellsway Station, was filled and graded. Drains on Whitmore Brook Road were relaid. New culverts were built, crossing various bridle paths in the Bear Hill section and the construction of Wright Memorial Tower was started. Platforms were built at headquarters for the receiving and loading of tar, asphalt and creosote.

The electric wiring in the barn was replaced and a section of the barn was enclosed for a stock room and a new harness room built. The wiring and plumbing in the other buildings at headquarters was kept in good repair as well as in the buildings owned by the Commission. The captain's residence on Pond Street was painted by contract.

Minor repairs and servicing of motor equipment have been taken care of by our own mechanics.

Lining out stock and shrubs to the value of about \$1,950 was received last spring. In the spring months and the early summer 421 evergreens, 673 trees, 1,167 shrubs and 1,500 various plants were shipped out to other divisions for roadside and reservation planting. Stock from the nursery which was used in this division, included 196 shrubs, 4,500 evergreens and 43 trees. Food crops which were raised for the zoo and stable included lettuce, beans, buckwheat, corn, mangels, cabbage, squash, carrots, etc., and rye for stable bedding.

Breakheart Reservation:

The C.C.C. camp is still in operation at this reservation, engaged in the work of building roads, clearing woodland areas and making picnic grounds. The house and barn on this reservation, which are the property of the Commonwealth, were repaired and electrical and plumbing work done as needed, by division forces. The entrance road was seal coated with asphalt and stone.

Alewife Brook Parkway:

This parkway has been kept in good repair. Gutters were swept, all catch basins cleaned out, grass plots cut and raked, shrubbery beds weeded and cleaned and the high shrubs at the junction of Powder House Boulevard and the parkway in Somerville were removed. Minor repairs were made to the roadway as needed; some fences were repaired and all were painted; signs were repainted as necessary and all traffic lines were repainted.

Lynn Fells Parkway:

The section of roadway between Tremont and Melrose Streets was seal-coated by our employees and also the section between West Emerson and Pond Streets. The usual work of cleaning gutters and catch basins, raking and weeding shrubbery beds, cutting and mowing grass was done. Sidewalks were repaired in some places and minor patching jobs with asphalt and stone were done as needed. Drains and culverts were cleaned and kept in repair.

Middlesex Fells Parkway:

The general work of cleaning the gutters, all catch basins and underdrains was carried on. All fences, signs and traffic lines were repainted. The Malden substation and police station were kept clean and in repair as well as the grounds around them. Sections of the grass strips along the Fellsway West were loamed and seeded. Low areas south of Roosevelt Circle were loamed to a higher grade and seeded. The lighting system at dangerous intersections was changed by substituting sodium vapor lights for the usual street lights. Sections of roadway were seal-coated with asphalt and stone by our employees between Roosevelt Circle and Salem Street, inbound, and between Revere Beach Circle and Mystic Avenue, Somerville, inbound.

Middlesex Fells Roads:

Gutters were swept, all catch basins cleaned, fences, signs and traffic lines were repainted as needed. Roadways were patched as breaks occurred, with asphalt and stone. A sunken area in the middle of Wyoming Avenue, Stoneham, was filled in and rolled to grade. South Border Road between Roosevelt Circle and the fish hatchery was seal-coated with asphalt and peastone.

Mystic River Reservation:

The mosquito control ditches on the marsh were kept clear. The state Board of Health declared the water at the bathing beach at Foster's Court in Medford to be polluted and banned bathing, thereby causing the bath house to be closed. Grass areas were cut and raked and debris was removed from the beaches and recreation grounds.

Mystic Valley Parkway:

The roadway was seal-coated from Kilgore Avenue to High Street, Medford, from Capen Street to Boston Avenue, and from Alewife Brook Parkway to Medford Street, Arlington. We assisted Frost and Higgins of Arlington in the moving and planting of large trees at the newly rebuilt Weir Bridge. A boom was placed across the Aberjona River with a screen attached to it so as to stop debris from floating into the Upper Mystic Lake. In co-operation with the Water and Sewerage Departments, decayed vegetable matter and other debris were removed from the Upper Mystic Lake. All fences were repaired and painted, grass was kept cut and the roadways cleaned and in good condition. Traffic lines, cross-walks and warning signs were all repainted.

Quannapowitt Parkway:

The entire roadway was seal-coated with asphalt and peastone. All fences and signs were repaired and repainted and the beach was kept free of debris.

Woburn Parkway:

The fence was repaired and painted. Grass was cut and shrubs trimmed. The roadway was kept in good repair.

Forestry:

Tree trimming work was carried out along a few miles of the bridle paths in various sections of the Mystic Valley and Alewife Brook Parkways, on Woodland Road from Half-Mile Road to Elm Street, on Fellsway West from South Street to Roosevelt Circle, on parts of South Border Road and Hillcrest Parkway. Tree trimming was also done adjacent to the Fellsway West Police Station and in the yard about the St. Denis House. In the woodlands a large amount of pruning was done in the nature of removing low and dead limbs, both to facilitate spraying operations, to improve the appearance and physical condition of the trees and in a large area in the Lawrence Woods for the additional purpose of letting more light in to small evergreens which had been underplanted and were suffering from too heavy a canopy. Other trimming work was done at various points as circumstances and special requests required.

Aided by the favorable weather of the past winter, brush cutting was conducted on about 150 acres in the Lawrence Woods, both for the purpose of freeing small

under-planted evergreens, to facilitate spraying operations and to reduce favored host plants of insect pests. Other brush cutting operations were carried on in parts of the Sheepfold playground area, Crystal Spring area, Virginia Woods area, Hemlock Pool area (70 acres) and Bear Hill area (50 acres). This type of work was also done at the junctions of various parkways and roads, on the roadsides of Pond Street, Woodland, Ravine and South Border Roads and Elm Street; also along Fellsway West and at other blind curves and corners.

Fifteen hundred Hemlock, fifteen hundred White Pine and fifteen hundred Scotch Pine were planted in various locations in the reservation. Several thousand Red Pine and Norway Spruce were lined out in the nursery to be grown for a year's root growth before being planted in the woodland.

Practically all of the parkways and public roads in the division were thoroughly sprayed, with the exception of the Carolina Poplars on the Fellsway and Fellsway East. All of the woodland adjacent to bridle paths, through which it was possible to drive with the sprayers, was sprayed. In addition, approximately eight hundred acres of woodland were thoroughly sprayed. Some oil spraying was done on the Red Pines along the Lynn Fells Parkway and likewise in various parts of the reservation.

Dead, dying, diseased or unsafe trees and some that were causing interference along some of the bridle paths were removed. The resulting cord wood, about thirty-five cords, was used on the reservation, sold to employees and a small surplus to the general public. Eight small maples and eleven Carolina Poplars which were killed apparently by the action of chemicals in filling used on adjacent property along the Fellsway south of Revere Beach Circle were removed. At different locations on the various parkways and reservation roads, other trees which had died or were extremely dangerous to the public, were removed.

The Canker Worm, Forest and Eastern Tent Caterpillars, which had been extremely abundant during the past two years, were not over plentiful the past season, but this favorable condition was many times offset by the super-abundance of the Gypsy Moth and the heavy invasion of the Pine Saw Fly. Spraying was successful in preventing complete defoliation except in small areas at scattered points, about one hundred acres in all. Unfortunately, in spite of the large amount of spraying done, the Gypsy Moth infestation has greatly increased.

The number of forest fires, the area burned and resulting damage, was small during the past season. Only one fire of any large proportion occurred during the year; this was off Quarry Road and called for the use of power equipment and a period of night work.

Planting on Shore Drive, along the Mystic River in Somerville, which was started in 1936, was completed in the past spring, using 85 shrubs and 16 trees. Some 25 trees of different kinds were planted at various places on the parkways, entirely as replacements.

The grass and brush as well as overhanging limbs around the Red Pines on Lynn Fells Parkway, were cut and a circle of sod removed around each tree to prevent further destruction by fire.

MIDDLESEX FELLS ZOO

The Zoo, which is located on Pond Street, Stoneham, adjacent to Spot Pond in the Middlesex Fells Reservation, is one of the principal attractions in our park system. Great interest is always shown in the new-born and young animals, of which there are many each spring. The Zoo is visited by five to ten thousand people each Sunday, with smaller attendance on weekdays. The animals, birds and reptiles on exhibition at the end of 1937 were as follows:

Animals:

4 Black Bears, 4 Mountain Lions, 2 African Lions, 4 Jaguars, 1 Ocelot, 2 Timber Wolves, 2 Coyotes, 11 Red Foxes, 1 Gray Fox, 2 Otters, 1 Mink, 1 Badger, 1 Mongoose, 1 Coatii, 2 Kinkajou, 9 Sheep, 8 Goats, 5 Peccaries, 2 Thar, 2 Llamas, 2 Texas long horn Steers, 7 Raccoons, 12 Gray Squirrels, 2 Fox Squirrels, 2 Porcupines, 4 Woodchucks, 1 Civet Cat, 4 Rhesus Monkeys, 4 Java Monkeys, 1 Vervet Monkey, 1 Megabey Monkey, 3 Lesser Green Monkeys, 2 Ponies, 4 White Fallow Deer, 7 Virginia Deer, 2 Siki Deer, 1 Buffalo, 4 Elk, 50 Guinea Pigs, 12 Rabbits.

Birds:

9 Egyptian Geese, 2 Snow Geese, 3 Blue Geese, 6 Canada Geese, 3 White front Geese, 1 China Goose, 2 Emden Geese, 3 Toulouse Geese, 10 Black Ducks, 2 Rosy billed Ducks, 6 Mandarin Ducks, 11 Wood Ducks, 4 Pintail Ducks, 1 Gadwall Duck, 2 Red head Ducks, 6 Call Ducks, 10 Crested White Ducks, 20 Mallard Ducks, 10 Pekin Ducks, 2 Runner Ducks, 2 Rouen Ducks, 16 Muscovy Ducks, 24 Blue Peafowl, 9 White Peafowl, 13 Black Shoulder Peafowl, 3 Lavender Guinea Fowl, 6 Purple Guinea Fowl, 3 Mongolian Pheasants, 6 Golden Pheasants, 3 Swinehoe Pheasants, 5 Reeves Pheasants, 3 Nepal Pheasants, 3 White Pheasants, 2 Manchurian Pheasants, 4 Formosan Pheasants, 16 Silver Pheasants, 2 Mutant Pheasants, 1 Versi-colored Pheasant, 6 Amherst Pheasants, 2 Ring neck Pheasants, 5 Black throated Pheasants, 6 Bob White Quail, 8 Valley Quail, 80 Pigeons, 2 Demoiselle Cranes, 2 Blue Macaws, 2 Red Macaws, 1 Sulphur Cockatoo, 5 Parrots, 1 Red tailed Hawk, 2 Golden Eagles, 1 Bald Eagle.

Reptiles:

1 Timber Rattlesnake, 2 Diamond backed Rattlesnakes, 16 Alligators, 1 Copperhead Snake.

Died During 1937:

1 Mountain Lion, 3 Bay Lynx, 2 Canada Lynx, 22 Muscovy Ducks, 12 Pheasants, 20 Peacocks, 1 Monkey, 3 Porcupine, 1 Raccoon, 1 Deer.

Born or Hatched During 1937:

7 Goats, 3 Sheep, 1 Monkey, 4 Deer, 30 Pheasants, 45 Peacocks, 40 Muscovy Ducks, 1 Porcupine, 10 Pekin Ducks, 1 White Fallow Deer.

Received as Gifts in 1937:

4 Red Foxes, 2 Sheep, 3 Swans, 2 Porcupines, 1 Coatti Mundi, 1 Skunk, 5 Sparrow Hawks, 12 Rabbits, 1 White Fallow Deer, 2 Elk, 6 Guinea Pigs, 1 Gopher, 30 Turtles, 4 Alligators, 2 Black Ducks, 4 Pekin Ducks, 3 Monkeys, 1 Female African Lion, 1 Otter.

Received in Trade in 1937:

1 Elk, 1 Eagle, 2 White front Geese, 2 Siki Deer.

Disposed of in Trade in 1937:

1 Mountain Lion, 3 Monkeys, 2 Egyptian Geese.

The Peacock cages and pony yard were reconstructed, guard rails were repaired and improved, the walks were all resurfaced and the goat yard was regraded and the house rebuilt. All cages, houses and guard rails were painted by contract.

CHARLES RIVER LOWER BASIN DIVISION

General Office:

This office being the nearest to the headquarters building, all labor work there, such as trucking of supplies from the State House, snow removal, sanding, etc., was done by men from this division. In addition, miscellaneous carpentry work and painting was done.

All roads and walks in the division were kept cleared of snow, and gutters and catch basin entrances were cleared after each storm. Two thousand feet of snow fence was set up and removed. It has been found, that in order to provide free travel on the roads in this division, it is necessary to plow and clear several areas that are not controlled by the Commission. The entire corner at Filene's Fur Storage building, the surface crossing at Massachusetts Avenue, and the cut-off road from Charles Street to Embankment Road are the principal extra intersections cleaned.

All police boats, life boats and life-saving apparatus was thoroughly overhauled, repaired and painted where required.

A considerable amount of time and labor was expended at the music shell on the Storrow Memorial Embankment in conjunction with the Symphony concerts. Special care is given to the lawn and shrubs in this area; an extra amount of watering

and fertilizing being necessary to keep them in condition. A portable house was erected for the use of the players as a dressing room, and each night on which a concert was held an attendant was present to care for the chairs and lighting. Each time a concert was given, the area was roped off and on the day following each concert a large force is required to clean up the site.

The outboard motor races have become very popular at the basin and require a lot of detailed attention. Referees and judges' stands are erected and starting and servicing sections are roped off. The sailing of model yachts has also become popular and stages have been built at the lagoon to facilitate sailing them.

During the year the trucks, tractors and police cars assigned to the division were serviced and repaired by the garage force. In addition, two cars detailed to Police Headquarters, and two belonging to the Administrative Office were maintained at the garage.

Storrow Memorial Embankment and Charles River Basin:

In addition to the maintenance of grass areas, shrubs, trees, signs and buildings, the following extra work was performed during the year:

The sanitary and service yard on the Embankment, both being below the street level, are subject to flooding after heavy storms, and from a backing-up of surface drains. It was necessary to clear them of water several times by means of hand pumping.

The police room at the service shed and the Tea House were repaired and painted and new stones were installed in both. A portable house used for checking shoes during the skating season, was repainted and erected in the fall and removed in the spring. The shores of the basin were cleared of driftwood and about 50 tons of riprap, which had been dislodged by ice were replaced between Massachusetts Avenue and Cottage Farm Bridge. About 225 square yards of concrete sidewalk were repaired along Embankment Road and some repairs were made to the road.

Eighteen hundred new shrubs were planted and all the shrubs and trees were pruned and sprayed. Tree pits and shrub beds were cultivated and fertilized and those trees that were in need of bracing were cared for.

Six new sand boxes were made and the old ones repaired, painted and lettered. New boxes were made to enclose life preservers which had previously hung on the iron fence. About 300 signs were made, lettered and put in place. Forty new stiff-leg settees were made and set out at various places in the reservation. Two new outhouses were built and installed at Gerry's Landing, and the old bath house there was repaired, the plumbing overhauled and a stove installed for the use of the young men working in that area under a Federal Youth Project.

Electrical repairs were made at the boat house, garage and police station. The various memorials along the Esplanade were washed and cleaned frequently.

Bunker Hill Monument:

General maintenance work was done which included mowing and care of the grounds in summer, snow removal and sanding in winter, reconstruction and repair of walks, repairing and cleaning of drains, repair and painting of settees, pruning and spraying of trees, etc. All the windows in the lodge and monument were removed, cleaned, repaired and painted. A new tar and gravel roof was installed over the lodge room. Extensive repairs were made to the plumbing, drainage system, electrical system and to the oil supply tank in the monument. Repairs were made in the lodge room and general maintenance and cleaning were provided.

During the year 32,544 visitors paid \$3,254.40 as admission fees to enter the monument.

Fresh Pond Parkway:

All paths were treated with stone dust and regraded, and plank walks were taken up in the spring, repaired and relaid in the fall. Trees and shrubs were pruned and sprayed and grass areas maintained.

Gerry's Landing:

A W.P.A. project sponsored by the Commission started work in 1936 and was completed during the year. The development of this area has opened up additional park land which is well patronized.

At the termination of the W.P.A. project a group from the National Youth Movement was put to work on the adjoining Gerry's Landing Beach, and about half the beach has been cut down to a new grade. Work has also been started on building a road adjacent to the river bank in the direction of Watertown, which will, when finished, allow better police patrol of the area and also provide a service road for general maintenance uses. The group has also cleared drains and removed brush from marsh lands in the area behind Cambridge Cemetery.

A sand box for children was placed near the Cambridge Boat Club and is kept filled with clean sand.

Magazine Beach:

The beach was improved by the placing of 400 tons of sand and by the installation of a new life line for the added safety of the bathers. The comfort station was repainted, inside and out, and the refreshment stand was repainted and signs and lights were installed on the roof. The lockers at the bath house were repaired, the locks overhauled and the roof repaired. Extensive plumbing repairs were made at the bath house and comfort station. All the floats and stairs used for yachting and swimming in the basin were hauled out on the beach in the fall and repaired, and put in position again in the spring.

During the year 7,403 bathers paid \$601.45 for the use of the bath house lockers.

Memorial Drive:

The roadway was patched and seal-coated by the division forces. About 2,000 new shrubs and trees were planted, and existing ones were pruned and sprayed. 1,000 cubic yards of loam was used for grading along the river bank and the ball ground, and for tree pits and new shrub beds. About 100 feet of new edge stone was installed near the Weld Boat House. The fence was cut and a new iron gate installed at the yachting floats opposite the Filene Fur Storage Building. The grass areas were cut over about once in five days and watered, and the road, gutters and basins were kept clear of trash and snow in season.

CHARLES RIVER UPPER DIVISION

Charles River Reservation:

During the winter season, roads, walks, gutters and catch basins were kept clear of snow and sanding was done when necessary. Fences, signs, buildings, floats and life saving stands were repaired and painted where needed. Road surfaces were maintained and traffic lines painted. Trees were pruned, dead and worthless ones were removed, and all trees were sprayed with arsenate of lead. Grass areas were maintained, underbrush thinned and shrub beds were cared for. The Speedway track was kept in condition and well attended matinees and horse shows were held by the Metropolitan Driving Club during the fall, winter and spring.

Miscellaneous construction and maintenance work was done as follows:

A concrete retaining wall, 350 feet long, 16 inches wide and $3\frac{1}{2}$ feet deep was constructed at the Riverside Headquarters.

An open band stand, 24 feet square and of wooden construction, was built at one end of the Speedway Playground. Electric lights were installed.

A wooden boat house was built opposite the Speedway Headquarters to house the police patrol launch. The building is 12 feet by 30 feet and rests on a concrete foundation, the walls of which are 1 foot thick and 8 feet deep.

A garage to accommodate 6 police cars was constructed at the Speedway Headquarters. It is 30 feet by 40 feet, is of wooden construction on a concrete foundation. It has a concrete floor and the interior and roof are of fireproof material. Electric wiring was installed.

The storage shed opposite the Speedway Headquarters was enclosed with 575 linear feet of 6 foot chain link fence. Approximately 150 feet of chain link fence was installed along Upper Charles Road near the Saltonstall Monument.

A section of reinforced concrete retaining wall, 378 feet long, $4\frac{1}{2}$ feet deep, and 13 inches wide was constructed near Moody Street, Waltham.

Public boat landings, $19\frac{1}{2}$ feet by 16 feet on wood pile foundations and with plank tops, were built at Moody Street Bridge and at Forest Grove opposite Fox Island.

A section of river bank 1,452 feet long and 5 feet wide between the Anderson and Weeks Bridges was rip-rapped to stop erosion, and the entire area, 33,000 square yards, between Soldiers Field Road and the river was loamed and seeded.

Work on Norumbega Road was taken over by the division's forces in July when the W.P.A. employees were taken off. The road was brought up to grade by using 4,500 cubic yards of fill, the surface was oiled and sanded, and the road opened for public use.

Approximately 200 linear feet of concrete curbing was installed between the new boat landing and Galen Street Bridge in Watertown.

The heating plant in the dwelling house at Forest Grove was renewed.

A number of trees and shrubs were set out along the reservation during the spring.

The Moody Street Playground was graded and loamed.

28 diseased hemlock trees at Hemlock Gorge were removed, and 30 young hemlocks were planted.

Trees and brush were removed at the junction of Intervale and Park Roads to eliminate an obstructed corner.

The grounds where the Frost Boat House stood were cleared of piling and made safe for canoeists. Dead trees were also removed from the area.

A parking space, which will accommodate about 100 cars, at Weston Bridge, was brought up to grade, oiled and sanded.

A memorial tablet to Leo M. Birmingham was placed at the junction of Birmingham Parkway and Market Street, and a traffic sign was installed at the same location.

A flood light for traffic duty was installed at the intersection of Soldiers Field Road and North Harvard Street.

A foot path was constructed along the river bank between Nonantum Beach and Y Light.

A rock garden was laid out and planted in front of Norumbega Tower on Norumbega Road.

Beaver Brook Reservation:

In addition to the usual maintenance work done in this area, the following extra work was performed:

Electric lights were installed in the public sanitary and band stand, the driveway to house and office was rebuilt, and two fireplaces were constructed.

A matron was on duty at the sanitary from May through September.

Many picnic parties visited the grounds during the summer.

Riverside Recreation Grounds:

Buildings, tennis courts, ballfield, track and pool were kept in repair. Grass, brush and weeds were cut and cleared up and fences, signs and posts were repaired and painted. Two slab urinals were installed in the buildings and four flower beds were laid out and planted.

Riverside Public Golf Links:

In addition to the general care and upkeep of the course, considerable work was done by W.P.A. forces which is reported under that heading on other pages.

Hammond Pond Parkway:

The parkway road was kept clear of snow and sanded, gypsy moth nests were destroyed and trees were sprayed, underbrush and weeds were cut and cleaned up, ditches were cleaned out, traffic lines were painted, and signs were repaired and painted. In addition, the following work was done:

A section of low area of about 5 acres was drained for prevention of mosquito pest.

Dead trees on a section adjacent to the Webster estate were removed.

Two fireplaces were built.

Fire breaks and property lines between the parkway and abutting estates in the Lost Pond Section were cut out and cleared.

BLUE HILLS DIVISION

Blue Hills Reservation:

Thirty thousand evergreens, such as white pine, red pine, spruce, etc., were set out in the section between Wampatuck, Chickatawbut and Sawcut Notch Roads, extending to the northeast boundary. This was necessary on account of the large area burned during the years 1935 and 1936. About 38,000 three-year old evergreens were received from the Massachusetts State College Nursery and set out in the nursery opposite the police station. About 500 water lillies of various colors, received from the Framingham Reservoir, No. 2, were deposited in Saint Moritz Pond, Hillside Pond and pond near Harland Street and Unquity Road. Ten white maple trees were set out off River Road south of Hoosicwhisick Pond. Thirty white pine and ten hemlock were set out as a screen between garage buildings and Unquity Road near the police station.

About 1,380 acres of woodland in the various sections of the reservation were sprayed with arsenate of lead and fish oil. 15,000 cubic yards of fill were applied in front and rear of the new garage near the police station; also two drains were constructed leading from the garage to a culvert which extends to and under Hillside Street. Five hundred feet of rustic fence was constructed along Wampatuck Road and Harland Street to replace old and inadequate fence.

Neponset River Reservation:

In addition to the regular work along the various sections of the Neponset River, the following new work was done:

From Dorchester Lower Mills to Paul's Bridge, Readville, about one hundred fifty dead trees were removed; also unnecessary underbrush such as rum cherry trees, which are host plants for tent caterpillars and other insects.

Two hundred and fifty white pine, 10 inches to 12 inches high were set out on the west side of Granite Avenue, Milton; also one hundred poplars were set out along the road on the west side, to replace discarded trees that were removed at an earlier date.

Quincy Shore Reservation:

In addition to the regular maintenance of the reservation, the following improvements were completed:

Fifteen dead poplar trees were removed and replaced with fifteen white maples.

A seal coat was applied to the roadway between Squantum and Fenno Streets. Five hundred cubic yards of gravel was applied to certain sections along the parking space between Williams and Sachem Streets. Nine thousand gallons of cut-back asphalt and 200 tons of stone were used.

Stony Brook Reservation:

In addition to the regular upkeep of the reservation, the following new work was accomplished:

Five thousand 5-year old pine and spruce trees were set out near the east boundary between Hyde Park and West Roxbury; also 25 willows were set out between Turtle Pond Parkway and Washington Street near the home of Mrs. Nellie Galvin (swamp land).

One drinking fountain was installed near the ball field adjacent to Turtle Pond Parkway. One hundred cubic yards of loam was applied to the ball field, and 60 cubic yards of stone dust was spread on the baseball diamond and base paths. Five thousand gallons of road oil and 140 tons of stone were applied on Bold Knob and Smith Field Roads.

Blue Hills Parkway:

In addition to the regular upkeep of the parkway, the following new work was done:

Three American elm trees were replaced. Twelve hundred feet of edgestone and twenty-four 3 foot radius corner blocks were installed between Brook Road and Warren Avenue on the east side of the parkway. Three hundred cubic yards of loam was applied between Mattapan Bridge and the parkway circle. Fourteen acres were sprayed for the suppression of moth disease.

Dedham Parkway:

In addition to the usual care and repairs the following new work was done:

A seal coat of 6,000 gallons of No. 3 cut-back asphalt and 120 tons $\frac{1}{4}$ inch stone was applied. Two banks on the east side of the parkway were graded. Forty cubic yards of loam was spread and planted with hay seed. About 60 acres on both sides of the parkway were sprayed, using arsenate of lead and fish oil.

Furnace Brook Parkway:

In addition to the regular parkway work, the following new work was accomplished:

Six thousand cubic yards of fill was spread in back of the Armory near Hancock Street, Quincy. (Co-sponsor with the City of Quincy to beautify the section.)

An old wire fence was removed, and a new wire fence installed between Dr. Dion's property and the property of the Commonwealth, opposite Cross Street, a distance of 200 feet.

Six white maple trees and 6 American Lindens were replaced between Adams Street and Newport Avenue, to correspond with existing conditions. Also about 50 willows were set out along the bank of the brook. Forty cubic yards of loam was applied on various sections of the parkway. Twenty-eight acres were sprayed with arsenate of lead and fish oil for insect suppression.

Neponset Valley Parkway:

In addition to the regular care of the parkway, the following new work was accomplished:

Two hundred shrubs were set out as replacements in the vicinity of Paul's Bridge. Three white maples were replaced and later in the season 6 dead elm trees were removed.

The sidewalk between Readville Square and Mahoney Gas Station was repaired and 50 cubic yards of stone dust was spread. Ten acres were sprayed with arsenate of lead and fish oil. A seal coat was applied to the roadway between Blue Hill Avenue and Brush Hill Road. Three thousand gallons of cut-back asphalt and 75 tons of stone were used.

Old Colony Parkway:

In addition to the regular upkeep of roads, sidewalks, catch basins, bath house and beach, the following new work was accomplished:

Twenty white maple trees were replaced in various places along the parkway.

About 500 cubic yards of stone which made the beach very uncomfortable for bathers, was removed from the east side of the parkway and placed on the west side in the low sections. Later the entire area was covered over while in the process of constructing the parking space.

Fifteen thousand cubic yards of gravel was placed as fill, and later 1,800 tons of type "E" No. 1 (fine material) was spread on top of the parking space to provide a smooth top. About 12 acres was sprayed with lead and fish oil.

The new bath house opened on August 13, 1937, which increased the amount of work in this section. The new bath house, a fence on each side of the roadway and walks around the building, were constructed by contract. A pedestrian traffic light was installed at Savin Hill Yacht Club by the Municipal Signal Service. The corners at entrance to Savin Hill Yacht Club were improved, and shrubs were planted.

Turtle Pond Parkway:

In addition to the regular care the following work has been accomplished:

Roadside banks from Washington Street to Turtle Pond were grubbed and graded, 150 cubic yards of loam was spread, and grass seed was applied. About 150 acres was sprayed with arsenate of lead and fish oil. The parkway surface was scarified and 25 tons of 2-inch stone was spread; then a seal coat applied on sections between the junction of Smith Field Road and River Street.

Veterans of Foreign Wars Parkway:

In addition to the regular care which includes the care of bath house and beach, the following new work was done:

Three hundred cubic yards of loam was spread between Spring Street and the railroad bridge in the center grass plot. Three hundred cubic yards of sand was applied to Havey Beach as replacement for sand washed away during the winter and spring of 1936 and 1937. One hundred and twenty cubic yards of gravel and 75 cubic yards of stone dust were applied to sidewalks between Gardner and LaGrange Streets.

Two catch basins and 150 feet of 12 inch vitrified clay pipe were installed on the sidewalk south of Baker Street on the east side.

The cross-over opposite Russett Road was closed and gravel and loam were spread to prevent traffic from using Russett Road in the direction of Brookline.

Fifteen pin oaks were replaced along the parkway in various places. About 5,000 pine and spruce seedlings, as a preventive to keep the banks from sliding after each rainstorm, were set out along the banks for temporary protection. This has been a great success and it is hoped that these can be removed in the near future as the grass seed has taken a good grip on the banks, similar to the result on Unquity Road in the Blue Hills Reservation.

Stone dust mixed with calcium chloride, was applied to prevent the growth of grass along the sidewalks.

West Roxbury Parkway:

In addition to the regular care the following new work was done:

Thirty-five dead trees were replaced with 35 sugar maples in various sections of the parkway. About 12 acres were sprayed with arsenate of lead and fish oil.

A stone wall, 150 feet long, 12 inches wide and 18 inches high, was constructed at the corner of Pelten Street and West Border Road, for protection of private property. This was necessary on account of change caused by the construction of our roadway. Four hundred feet of stone wall about 24 inches in height, was constructed along our parkway in a northerly direction from Church Street. This was necessary because of the appearance at the junction of Commonwealth property and City of Boston property along Church Street.

A seal coat of cut-back asphalt No. 3 was applied to both East and West Border Roads. Four thousand gallons of material and 90 tons of stone were used. About 50 cubic yards of loam was placed on East and West Border Roads. Four thousand gallons of material and 90 tons of stone were used. About 50 cubic yards of loam was placed on East and West Border Roads grass plots, between the roadway and the sidewalk.

About 150 regulation signs purchased from the Department of Correction were erected in the division during the year, on the following roads and parkways:

Quincy Shore Reservation, Chickatawbut and Blue Hill River Roads, Furnace Brook Parkway, Old Colony Parkway, Veterans of Foreign Wars Parkway and West Roxbury Parkway.

These signs are in compliance with the prevailing regulation signs used by the Department of Public Works and approved by our own department: "Keep in Single Line", "Horses Crossing", "Use Right Lane Except When Passing", "Curve", "Stop", "Caution" and "School" signs. These signs replaced old wooden ones.

NANTASKET BEACH DIVISION

At the Bath House, copings on sections of the parapet wall were rebuilt, the locker doors were repaired, new sections of water pipe were installed in the laundry, exterior wood trim was painted, and the building was generally maintained and kept in good repair. New concrete footings were poured under the spa, and a new steam line was installed.

A potato room was constructed at the Cafe, with concrete footings and floor, and new water connections and drains were installed. A shower bath and a urinal were installed in the yard and the shower rooms were sheathed and new doors were installed. The kitchen sink was replaced and the Detex clock system was repaired. The roofs, sidewalks, floors, stairs, hand rails, screens, cornices and plastered walls were repaired and the wooden fire escape was rebuilt. New window sash and frames were installed. The outside of the building and much of the interior wall surfaces were painted and the ceilings were kalsomined.

The hotel was repaired by renewing clapboards and flashing and erecting new supporting columns and hand rails on the piazza. The outside of the building was painted, interior side walls were patched and painted, and ceilings were repaired and kalsomined. New cold water supply lines were installed in the cellar, the hot water line was replaced, conductor pipes and goosenecks were replaced, the Detex clock system put in good order and locks were repaired.

A drinking fountain on a concrete stand was installed at the North Sanitary, a bowl was replaced and the interior and exterior walls of the building were painted.

Eleven hundred and ninety-seven hundred feet of concrete curbing were set-in place at the North Parking Yard, 383 square yards of sidewalk were concreted and a wooden bumper was constructed.

Twenty-seven concrete piers and footings were poured under the pavilion and cafe. A new section of sidewalk was laid in front of the pavilion and the stairs, hand-rails and floors were repaired. Eight trusses with 26-foot span, 3 trusses with 22-foot span, and 12 18-foot supporting columns were erected, 21 shutters were made and the outside surface of the structure was painted. A section of steam line to the lunch room was renewed, new joists, girts and floor were put in and 592 square feet of wall was sheathed and paneled with molding.

At the Police Dormitory a new beamed ceiling was built in the dining room, the sewer pipe was repaired, the domestic hot water line was renewed, the hot and cold water supply lines to the second floor were replaced and the screens were repaired and renewals made.

The cell rooms in the Police Station were painted, new rubber treads were laid, and screens were repaired and renewed.

Two hundred and eight yards of concrete were placed for a floor in the Tar Yard.

Floors, stairs and hand-rails were repaired at the Tivoli Shelter, 6,500 square feet of roll roofing was applied to the roof, a new water pipe was installed for the shelter stand and the inside of the shelter was painted.

Three hundred and sixty-three feet of concrete seawall and 2 flights of reinforced concrete steps were built by the division forces.

A concrete bulkhead was built at the waiting room, 2 triple sets of show windows were installed and a new counter was built. The exterior trim and the iron fence around the shelter were painted.

Street lines, signs, lamp posts, flag poles, settees, hedge and shrub shutters, life boats and life guard tower were painted. Life boats, life guard tower and band concert signs were lettered.

The street, beach, piazzas, parking yards, walks and catch basins were kept clean. Lawns, shrubbery, sanitaries, buildings, automobiles, heaters, etc. were cared for, and the fire hose was tested and repaired and 58 fire extinguishers were refilled and placed. Snow was removed and snow fences were erected and removed.

About 900 tons of sand were removed from the south parking yard, the parking yards were oiled and sanded, and 2,400 square yards of new parking area was made.

BATH HOUSES

The bath houses and beaches operated by the commission were open each day from June 26th to September 7th, with the exception of Malibu Beach Bath House, which opened for the first time on August 13th at the completion of construction work. Most of the bath houses were opened intermittently on days previous to June 26th, and Revere Beach Bath House was open each day from May 31st on.

The attendance and receipts for the 1937 season at the bath houses at which fees are charged were as follows:

	Number of Bathers	Receipts
Nantasket Beach	96,486	\$21,330.75
Revere Beach	71,753	15,871.20
Nahant Beach	18,368	4,278.25
Magazine Beach	7,403	601.45
Malibu Beach	2,633	263.30
Hoosicwhisick Pond	2,584	258.40
Havey Beach	1,891	189.10

Other bath houses are maintained at the following locations on a free basis:

Mystic River, Medford—Foster's Court

Upper Mystic Lake, Winchester—Sandy Beach

Charles River Reservation, Brighton—Brighton

Charles River Reservation, Brighton—Faneuil

The bath houses and beaches at Foster's Court and Sandy Beach in Medford were not opened during the season because of the finding by the State Department of Public Health that the Mystic River was polluted by the overflow from surcharged sewer mains in that and the Aberjona River, a tributary. Bathing was banned along the entire river.

GOLF COURSES

The Commission's two eighteen-hole public golf courses, Riverside in Weston and Ponkapoag in Canton, were open for the summer season from early April to November 30. The gross receipts received were \$25,864.20 at Ponkapoag and \$15,128.20 at Riverside. 475 seasonal memberships at \$20.00 each were sold at Ponkapoag and 315 at Riverside. A total of 35,000 rounds were played at Ponkapoag and 17,000 at Riverside.

In addition to the general maintenance of links and buildings at both golf courses, considerable work has been done at each location by W.P.A. forces, the major item being the continuance of work on the construction of nine additional holes at Ponkapoag.

BAND CONCERTS

A sum of \$20,000 was appropriated by the Legislature to be used by the Commission for furnishing band concerts in the Parks District. \$19,773.78 was spent to provide a total of 123 scheduled concerts which were played by 68 different bands at 17 locations. An estimated total of 67,000 people attended the concerts in addition to unknown hundreds of thousands present at Nantasket Beach, where afternoon and evening concerts were played on each of 24 dates during the bathing season. Bids for concert work were received from 105 bands in the district.

The music shell on the Boston Embankment was used for the presentation of the ninth annual summer series of symphony concerts given by a group of fifty members of the Boston Symphony Orchestra under the leadership of Arthur Fiedler, Conductor. The series included 23 concerts played between July 8th and August 3rd. Large and attentive audiences were present at each concert; the total attendance for the series being estimated at 225,000. 74,177 folding chairs were rented during the season, and as its share of the receipts from the concession, the Commission received \$1,455.52 which was deposited with the State Treasurer.

CIVILIAN CONSERVATION CORPS

The Blue Hills Reservation C.C.C. Camp continued its program of recreational development in the reservation until September 28, 1937, when a periodic curtailment of C.C.C. activities resulted in its closing. The Commission made a determined effort to keep the camp in operation as its work program was accomplishing highly desirable improvements in an area where they were given much more intensive use by the public than any of the other C.C.C. Camps continuing in operation in the state. The company, which operated at a very high degree of efficiency, led all other First Corps Area camps in general excellence and was flying the honor pennant as the best camp in New England when it ceased operations. Members of the company were transferred to other camps and the services of the supervisory force were terminated. All camp equipment was sent to storage depots and a government caretaker was assigned as a watchman for the camp buildings. The commission is hopeful that an opportunity to put the camp on an active basis may arise in the future.

The camp work crews assigned to the creosoting of gypsy moth egg clusters continued the work started in the fall of 1936 until the spring hatching period. The reservation as a whole was badly infested but the 1,200-acre section in which the efforts of the camp boys were concentrated demonstrated the value of such work in a very effective way. The construction of the stone observation tower on Great

Blue Hill was substantially completed and construction of the adjoining shelter was started. The second section of the cross country ski trail from the Nahanton Hill practice slope to Randolph Avenue was reconnoitred by a skiing expert, and development of the section was in progress when the camp closed down. An additional three miles of police signal service lines were reconstructed and two sections of the line were placed underground in the West Quincy end of the reservation. About 15,000 pine and spruce transplants were set out in the vicinity of Buck Hill and water holes for moth spraying and fire protection were developed in suitable locations. About seven miles of truck trails and service roads were reconstructed, principally in the 500 acre tract acquired from the James Estate. The development of the Pakomet Spring area was extended to include a sizable picnic ground with tables, benches and fireplaces. About 22,000 man days of labor for the year 1937 were expended on all work projects at the time the camp ceased operations.

The camp in Breakheart Reservation has made substantial progress on its work program during the year, and it is expected that the development of recreational facilities will be far enough along in the early summer to allow a limited use of the area by the public during week ends. The commission has found it necessary to discourage unrestricted use of the reservation as construction operations by the camp work details has made it advisable to do so because of the dangers involved.

The dams and dykes on the Upper and Lower ponds have been repaired and strengthened. The ponds will undoubtedly be very popular for both summer and winter recreational use. The motor road is practically completed but will not be given a permanent surface until the necessity for operating heavy equipment over it is eliminated. A large parking area near the lower pond, which will accommodate about one hundred cars, is finished. The development of a picnic area in a four-acre grove of large white pines is now underway. In addition to a water supply and sanitaries, enough tables, benches and fireplaces will be provided for one hundred and fifty people and an adjacent parking space will take care of about fifty cars. An 800 foot stretch of roadway from Quarry Road to the top of Pine Hill in the Middlesex Fells Reservation was built to provide access to the site of the Elizur Wright Memorial Tower. Construction of the double driveway entrance road from Lynn Fells Parkway to the reservation proper has been started and is progressing satisfactorily. The gypsy moth scouting details continued the creosoting of egg clusters in both Middlesex Fells and Breakheart Reservation until the start of the spraying season. A detail of twenty boys were assigned to the sprayer crews while spraying operations were carried on. Creosoting was started again in October and a vigorous campaign will be pursued through the winter in both reservations as the infestation is unusually severe. An authorization has been obtained from the National Park Service to establish a side camp at Blue Hills Reservation in order that the tower and shelter on Great Blue Hill and the Pakomet Spring development may be completed. A total of 27,000 man-days of labor were expended on all work projects.

WORKS PROGRESS ADMINISTRATION

An appropriation of \$50,000 by the Legislature enabled the Commission to continue and commence many desirable projects during 1937, in conjunction with the Works Progress Administration for Massachusetts. All supplies, tools, equipment, most materials and the services of many permanent employees were supplied by the commission, while the W.P.A. furnished and paid for all labor, both common and skilled, and some supervision. Of the \$50,000 available, \$49,866.27 was either spent or obligated for supplies and materials. In addition, personnel and equipment, regularly employed, having a total value of \$91,969.50 was furnished. The Federal funds allotted totaled \$547,852.31. The projects completed or now operating or approved will have a total value, on the W.P.A. basis, of \$670,000 which cost the commission only \$50,000 more than would have normally been expended for park maintenance and minor construction.

Twenty-two new projects were approved during the year and many projects in progress at the beginning of the year were carried on to completion. The new projects will provide about 6,000 man-months of relief labor for about 1,800 men.

The following is a list of all the projects operated during the year, including those continued from the previous year:

Metropolitan District Commission Headquarters Building; painting, with two coats, all interior walls, columns, partitions, all exterior metal work, window sash and frames, rebronze all radiators and kalsomine all ceilings. The work will be completed about March 1, 1938.

Metropolitan Parks District; the traffic survey project which was started in 1936 for the purpose of taking traffic counts, compiling accident reports, preparation of accident frequency maps, etc., operated until November, at which time the work was suspended.

The Recreation and the Radio Survey projects are discussed under special headings at the end of this section.

West Roxbury Parkway; all the rough work involved in the construction of a road and parking space at the top of Bellevue Hill has been completed. The finished surfacing (bituminous) will be done in the spring of 1938.

Furnace Brook Parkway; fill was furnished and placed for a parking space in the rear of the Quincy Armory; the commission being a co-sponsor with the City of Quincy.

Furnace Brook Parkway; landscaping work was done along the parkway between Willard Street and the St. Moritz sports area.

Blue Hills Headquarters; a 120-foot by 40-foot by 14-foot fieldstone and brick garage with a reinforced concrete slab roof and steel girders and lally columns, was completed at the division's headquarters on Hillside Avenue, Milton.

Malibu Beach; a parking space of about 3,000 square yards was constructed at the beach, off the Old Colony Parkway, Dorchester.

Blue Hills Reservation; two baseball diamonds and four tennis courts were built in the sports area south of Hoosicwhisick Pond in Milton.

Veterans of Foreign Wars, West Roxbury, and Turtle Pond Parkways; the roadsides of these parkways were beautified for their entire lengths by grubbing, grading and seeding. Ten miles, or 176,000 square yards of property was reclaimed.

Dedham Parkway and Turtle Pond Parkway; a project in operation at the end of the year will provide a parking area on each of these two parkways in the Hyde Park district.

Stony Brook Reservation; 8 miles of bridle roads in the reservation were improved by widening, grading and the application of gravel.

Ponkapoag Public Golf Course; work was continued during the year on the nine additional holes to be constructed at this course. Most of the clearing, grubbing and drainage work had been completed at the end of the year.

Blue Hills Division; 29 buildings of all types in the division were painted on the outside and 7 were painted on the interior.

Blue Hills Reservation; work was started in December on a project which will employ about 300 men for four months, performing insect pest control work for the elimination of Gypsy Moth infestation throughout the reservation. The principal items of work are the removal of dead and undesirable trees, shrub growth, etc., creosoting of egg clusters and the spraying of infested trees. The entire reservation comprising 6,700 acres will be worked over.

Gerry's Landing, Charles River Lower Basin; a project for the improvement of this area was started in 1936 and completed during the year. Extensive improvements were made which involved work of grading, loaming and seeding grass areas, filling of low lands, construction of gravel walks, service roads, etc.

Riverside Public Golf Course; this golf course, in Weston, was greatly improved by the completion of work started in 1936. The major items of work were: the removal of a hill (3,500 cubic yards of gravel) and construction of a new tee and green at No. 16 hole; seventeen tees were enlarged by approximately 35 square yards each; dead trees at No. 12 and 15 fairways were removed and 75 young pines were set out; approximately 5,000 feet of irrigation pipe was installed.

Forest Grove Road, Waltham; a project to widen, relocate and improve this roadway, which traverses land in the Charles River Reservation, was approved and work was started in November, 1937. The bulk of the work will, however, have to await favorable weather in the spring.

Hammond Pond Parkway; work was begun in November on a project which provides for the improvement of an area between the parkway and Hammond Pond in Newton. The work includes laying 300 linear feet of 24-inch drain pipe,

filling a low area with about 12,000 cubic yards of gravel borrow, spreading about 3,000 cubic yards of loam, grading and seeding and thinning and grubbing 20,000 square yards of underbrush. Most of this work will also be done during 1938.

Fellsway Police Station; the area adjacent to the police station on Fellsway West in Medford was developed by the completion of a project started in 1936. A large baseball field and drill ground was constructed, the brook along the roadway was confined between stone masonry walls to prevent flood damage and incidental work was performed.

Middlesex Fells Reservation; four miles of bridle trails in the Lawrence Woods section of the reservation were reconstructed. The trails were widened and graded and new cross drains and culverts were installed where necessary. The work was started in 1936 and completed in 1937.

Middlesex Fells Reservation; a project is now in operation which will provide for insect pest control for all infested areas in the reservation. The work is directed primarily towards the eradication of Gypsy Moth and Forest and Tent Caterpillar infestation. The work will proceed through the winter and early spring.

Bellevue Ponds, Medford; work was started in the late fall of 1937 on a project for improvement and development, as a recreational area, of the Upper and Lower Bellevue Pond and surrounding land on South Border Road near the Roosevelt Circle. The ponds will be dredged and cleaned, gravel placed on banks, rubble masonry spillways constructed, the surrounding woodland thinned and improved and gravel walks will be built.

Nahant Beach Reservation; the large automobile parking space adjacent to the boulevard was improved and enlarged by the completion of a project started in 1936. The area was improved and made safer for the use of automobiles by the installation of rip-rap shore protection and filling and grading of the parking space. About 3,200 cubic yards of heavy stone was placed for shore protection and 12,500 cubic yards of earth and rock were excavated and placed in regrading the auto park, the usable area of which is now about 70,000 square yards.

Nahant Beach Reservation; a bituminous concrete surfaced promenade 6,300 feet long and 10 feet wide was completed parallel to the boulevard and extending from the bath house to Wilson Road on the ocean side. In addition to being used as a pedestrian walk, the promenade may be used for emergency ambulance service on occasions when the roadway is badly congested with traffic.

Five projects were approved in the late fall and work on these will be started as soon as ground conditions are suitable in the spring of 1938. They are:

Blue Hills Parkway, from Kahler Avenue to Canton Avenue, Newton; to construct 6,900 linear feet of 6-foot wide bituminous concrete sidewalk, 9,200 linear feet of 9-foot wide planting space and 4,600 linear feet of 5-foot wide planting space.

Hammond Pond Parkway, Newton Street traffic circle to Boylston Street, Newton; to construct a 5-foot wide pea stone and stone dust walk and a 10-foot wide planting space, each 4,200 feet in length.

Quinobequin Road, Newton, Washington Street to Boylston Street; to construct a pea stone and stone dust walk 5 feet wide and a planting space 10 feet wide, both 9,400 feet long.

Middlesex Fells Reservation, Winchester Section; to widen, drain and grade three miles of bridle trails. The trails to be for equestrian, police patrol, fire control and maintenance use.

Revere Beach Reservation; to rebuild two concrete truck and ambulance ramps to the beach; to build 700 linear feet of 4-foot high concrete sea wall near the North Circle; and to build 576 linear feet of 7-foot high concrete sea wall and concrete-over terraced steps to form a ramp at the shelter in front of the bath house.

During the year, the commission received full and cordial co-operation from W.P.A. officials, both in the field and office, in the preparation of project proposals and the conduct of work on approved projects. By an administrative ruling, all W.P.A. employees were required to apply themselves diligently to their assigned tasks, and as a result, the utmost benefit was derived from all Federal funds used for W.P.A. work.

An effort will be made in 1938 to again secure a budget allotment of \$50,000 to allow the commission to participate in the W.P.A. program of relief work.

POLICE RADIO SURVEY PROJECT

Since the Metropolitan District Commission sponsored the W.P.A. Radio Survey Project, the engineers have been engaged in planning and creating an efficient two-way police radio system. The experimentation and research work handled by these qualified men is developing a modern communications system for the territory under the jurisdiction of the commission that will be comparable to any in the country. It is also felt, that the system will greatly increase the effectiveness of the Commission's services which have for more than forty years been rendered to the forty-three communities of over two million persons. Protection of the health and safety of the inhabitants of the municipalities which comprise the Boston Metropolitan areas will be increased through the development and maintenance of this most modern communications network.

At the end of the year 1937 the results of the Police Radio Survey is evidenced by having in actual operation a crystal controlled high-powered transmitter, licensed by the Federal Communications Commission for a maximum power output of 500 watts; a specially constructed "J" type antenna, employed with a newly developed feeder cable arrangement; and three cars equipped to both receive and transmit messages and tests. When not actually engaged in field work these three radio equipped cars are available for routine police duty. During the year 1937, there has been added to this equipment two portable radio sets for use in such emergencies or exigencies as floods, fires, boat portage, etc. This equipment, with several smaller units are constructed to operate efficiently on the same frequency as the transmitter and receiver at the main control room located at 20 Somerset Street in Boston.

To fulfill the purpose of the Radio Survey Project, namely to develop a communications system sufficiently proper to meet the needs of the Commission, it was necessary to conduct tests both from the cars to headquarters, and from headquarters to the cars, over roads and paths that are police patrolled, and accessible by automobile. These tests were conducted throughout the year, and during both the days and nights, with all qualities of reception at every location recorded by proper registering meters.

The following list of field readings were made this year as a basis for proposed field pick-up points (receiving stations).

- 3,766 Readings made using a location in each division as a pick-up point.
- 1,058 Readings made from mobile units to M.D.C. Headquarters.
- 250 Readings made from M.D.C. Headquarters to mobile units.
- 562 Readings made from mobile units to permanent location in Blue Hills Division.
- 625 Comparative readings from Headquarters to mobile units, M.D.C. No. 197 and M.D.C. No. 198, for equipment tests.

6,261 Total

In order to cover the entire Metropolitan District, it is necessary to have the antenna of the main transmitter erected well in the clear of any surrounding objects. When the antenna at 20 Somerset Street was first built, every effort was made to fulfill this condition, but during the year the Suffolk County Court House has been constructed. This new building is much higher than the top of the Headquarters antenna. Tests have indicated that this structure is acting as a shield, greatly reducing the amount of signal to be received in Revere, Winthrop and Nantasket.

The mobile radio transmitters used in the police cars are necessarily limited as to power output and antenna height. These limitations make it impossible for cars operating in the outlying areas to communicate directly with Headquarters. To overcome this condition, it is necessary to locate receiving stations at selected points in the territory to be served. The field strength tests conducted by the Survey have determined that with receiving stations at Lawrence Observatory in the Middlesex Fells and at Blue Hill, it will be possible to hear the cars at any point in the district. A "J" antenna was installed on the roof of the Harvard Observatory at Blue Hill to operate a receiver located in the building. This receiver feeds into a direct wire running to 20 Somerset Street, Boston. At the Boston end a line

amplifier built by the Project is used to operate a loud speaker or other equipment. This circuit operates unattended on a 24-hour a day basis and is ready to be used as a part of the permanent installation. At the Lawrence Observatory an antenna similar to the Blue Hill installation has been erected. During 1938 this circuit will be completed by the addition of a receiver and telephone line to Boston.

All construction and testing work on the Radio Project has been accomplished by W.P.A. labor and through W.P.A. funds. Material and equipment installed has been purchased by the Commission.

W.P.A.—M.D.C. RECREATION PROJECT

In the late fall of 1936 the commission, in collaboration with the Massachusetts Committee to Further Outdoor Recreation, drafted and submitted to the W.P.A. a project proposal which would provide supervision and instruction in skating and other winter sports in the Charles River Reservation and other suitable areas controlled by the Metropolitan District Commission. The primary purposes of the project were to interest and encourage children (in particular) and adults from the large cities and towns in the district to actively participate, under intelligent guidance, in winter sports as a healthful form of recreation, and to publicize the many natural assets contained in the Metropolitan Parks District which are available to the public on a free basis.

The winter of 1936-1937 proved to be so mild that no winter sports were possible in the local area. Therefor, an idea which had been conceived at an earlier date was developed, namely, to develop a program of hikes, nature walks, supervised play, etc.

The personnel of the project comprised 29 members, of which two were publicity men and one a recognized naturalist and conservationist. Other members of the group were used as instructors and to organize groups and to interest churches, societies, boy and girl scout troops, Y.W.C.A. etc., in the activities of the project. Weekly notices of all scheduled functions were mailed to all interested groups and individuals; a mailing list of over four hundred names being maintained.

Hikes of five and ten miles each were well patronized and shorter walks of about two miles conducted by the staff naturalist were well attended, and very beneficial to all, as instruction in geology, mineralogy, birds, flowers, trees, etc., was given as the parties walked along. The hikes and walks were at first held only on Saturdays and Sundays, but later in the spring it was found necessary to conduct mid-week walks for women's groups, etc. During the summer, instructors were assigned to playgrounds, principally to give instruction in tennis, and men were assigned to bathing beaches to act as life guards and to give instructions in swimming and life saving. Also during the summer, on several days a week, children's groups were supervised at the playgrounds in games and sports in keeping with the weather conditions. When the football season arrived in the fall, goal posts were erected on the most popular playgrounds and instruction was given by recognized coaches in football passing, kicking, etc. Co-operation with the National Youth Administration being possible, 700 bird houses were built and set out in the various reservations during the fall, and ice skating areas were laid out and dyked at Speedway Beach in Brighton, at Magazine Beach in Cambridge, and at Faneuil Beach in Brighton.

The programs of this project have proven very popular, and a conservative estimate, based on an approximation of the attendance at each event, shows that more than 400,000 persons have participated in the activities during the year. A project supplement was approved in November, and the funds now available will permit the continuance of the project until the spring of 1938.

V. Recommendations to Legislature

In accordance with the provisions of Section 33 of Chapter 30 of the General Laws as appearing in the Tercentenary Edition thereof, the following recommendations were submitted and contained in House No. 44:

I. RECONSTRUCTION OF THE REVERE BEACH PARKWAY IN MEDFORD, EVERETT, CHELSEA AND REVERE

Under the Boulevard Act (Chapter 288 of the Acts of 1894) lands were taken for a parkway from the Charles Eliot Circle, at the southerly end of the Revere Beach Reservation in Revere, to the Middlesex Fells Parkway in Medford, a distance of about five and one-quarter miles. Construction was started in 1899 and the entire work completed in 1905. This roadway was originally built about 30 feet wide on a clay base which was satisfactory for the proposed horse and buggy use, as the era of enormous automobile travel was not contemplated. Since that time it has been necessary to reconstruct certain portions of this parkway, due to settlement caused by the heavy automobile travel.

At present it is one of heaviest traveled motor arteries north of Boston in need of reconstruction. Since the location of the horse-racing track was established in Revere, adjoining the Revere Beach Parkway, and the location of the dog-racing track within a very short distance of this parkway, this already overloaded roadway is choked with traffic whenever races are held. The narrow parkway, only 30 feet wide in places, is so congested on week-ends, holidays and days when the population desires to reach the beaches or the North Shore, that hours are consumed to travel a distance that should take only a few minutes.

The Commission having in mind the burden of taxation carried by the municipalities comprising the Metropolitan Parks District for benefits enjoyed by others, is of the opinion that, as this artery is extensively used, not only by those living outside the parks district, but also for interstate traffic, being a portion of United States Route No. 1, this improvement should not be assessed on the parks district, but the entire cost should be taken from the Highway Fund, with a contribution by the Federal government if possible. This parkway or boulevard should be reconstructed so that it will have a minimum total roadway width of 100 feet, divided with a reservation of planting area and such traffic circles, overpasses or underpasses as are necessary to eliminate dangerous traffic and pedestrian intersections.

With a population of the district that has doubled since the parkway was first authorized, and the tremendously increased automobile traffic that now uses this parkway, the Commission respectfully requests favorable authorization of this essential legislation.

II. RECONSTRUCTION OF THE OLD COLONY BOULEVARD FROM COLUMBIA CIRCLE TO THE SOUTHERN ARTERY TRAFFIC CIRCLE, BOSTON

The need of a traffic highway for pleasure vehicles en route from Boston to the South Shore and the Cape was felt twenty-five years ago when the Legislature appropriated money for the Metropolitan Park Commission to purchase land along the shore front of Dorchester Bay in order to work out the problem. Portions of the areas had been used as dumping grounds, while others were mud flats.

Owing to limited appropriations that authorized the construction of this roadway, it was impossible to construct a proper base for the present Old Colony Boulevard; consequently, it is uneven, due to settlement which necessitates constant repairs. This boulevard has become the main traveled artery from Boston to the South Shore and the Cape. It is 40 feet wide and about three miles long, and, due to its narrow width, is choked with traffic its entire length, more especially during the incoming traffic in the morning and the outgoing traffic in the evening.

Recommendations similar to those made in the report on the Revere Beach Parkway are respectfully submitted for the Old Colony Boulevard, and the Commission is of the opinion that the cost of reconstructing this traffic artery should also be taken from the Highway Fund.

III. CONTINUATION OF THE NEW MYSTIC VALLEY SEWER

Under chapter 478, acts of 1935, the Metropolitan District Commission has completed the portion of the New Mystic Valley sewer of the North Metropolitan System. It was brought to the attention of the Legislature, through its metropolitan affairs committee and the ways and means committee, that the construction of the section of sewer authorized by the above act was only a part of a comprehen-

sive scheme for building of a necessary relief sewer throughout the entire length of the North Metropolitan District. The completed section will entirely relieve the Aberjona River, the Mystic Lakes, and in great part, the Mystic River above Cradock Dam, from pollution by sewage. This section necessitates an overflow in the tidal waters of the Mystic River just below the Cradock Dam, making a very serious health problem, particularly in the summer months. The added pollution to the Mystic River which was already receiving a great amount of sewage overflow necessitated the closing of bathing beaches in Medford and Somerville, used by a large number of people. Recurrence of these conditions is inevitable until the extension of this relief sewer is constructed.

Under chapter 433, acts of 1937, the Legislature appropriated \$4,500,000 subject to a 40 per cent grant by the Federal government. As the Federal grant was not forthcoming, the Commission, acting under section 7 of said act, which appropriated \$270,000 of state funds, has started work of making surveys and preparing contract plans and specifications for the continuation of the Metropolitan relief sewer to the vicinity of Addison Street, East Boston. This construction will involve approximately about 21,000 feet of relief sewer, varying from 8 feet 6 inches in diameter to 13 feet in diameter.

The Commission recommends that an appropriation of \$4,230,000 be made in 1938 to complete this branch of the North Metropolitan System.

IV. DREDGING AND IMPROVING A PORTION OF THE UPPER MYSTIC LAKE AND A PORTION OF THE ABERJONA RIVER IN WINCHESTER

For several years bills have been presented to the Legislature to dredge and improve a portion of the Upper Mystic Lake, but no relief has been given. Conditions were so bad the past summer that the entire town of Winchester was aroused, and emergency measures were adopted by the Metropolitan District Commission, assisted by the State Department of Public Health, in order to relieve this nuisance. Large groups of men worked for the greater part of the summer removing floating areas of scum and filth that came to the surface from the bottom of the lake. This was caused by the polluted matter carried down the Aberjona River during the past few years, and partly from the surcharging of the old North Metropolitan Sewer into the Aberjona River, which emptied into the Upper Mystic Lake. With the completion of the additional Mystic Valley relief sewer this condition has been remedied.

Early in June attention was called to a large number of midges (*Chironomus*) in the vicinity of the Upper Mystic Lake. This insect resembled a mosquito which, although it does not bite, results in a nuisance. About the first of July, a large number of dead fish appeared along the shores of the upper lake. The Department of Public Health investigated and found that the large amount of putrescible organic matter in the upper lake was decomposing rapidly because of the increased temperature of the water in the lake. This condition resulted in the depletion of the oxygen content of the water, and was particularly unfavorable to the fish, but favorable to the hatching of midges. As the warm weather continued and evaporation and reduced flow in the Aberjona River caused the lowering of the lake, a very objectionable odor arose from low water and exposed flats. This condition was so unbearable that residents living in the immediate vicinity of the lake had to vacate their homes at a time of the year when the greatest benefit of their property should have been enjoyed.

The State Department of Public Health mounted a pump on skids and with the assistance of this Department sprayed the area with a solution of hypochlorite of lime to reduce the odor. Men continued to remove the sludge and refuse from the shores.

The upper portion of the Upper Mystic Lake that should receive immediate attention has a water surface of 42.5 acres, with mud ranging from 1 foot to 20 feet in depth. Boating is impossible in certain parts, as the depth of the water is too shallow to allow even a canoe to float. A channel should be cleaned out to allow the free flow of water from the Aberjona River to the larger body of water of the upper lake, a distance of 2,000 feet. Portions of the Aberjona River should also be cleared to allow the free flow of water. The Commission strongly urges that this

menace to health, which also resulted in the closing of a bathing beach used by thousands of citizens each year, and which will recur each year, should be given favorable consideration, and that an appropriation of \$150,000 be made.

OTHER IMPROVEMENTS AND RECOMMENDATIONS

The Metropolitan Water Supply is now taken almost entirely from the Sudbury Reservoir located in the city of Marlborough and the town of Southborough. Water collected and stored in the principal storage basin, Wachusett Reservoir, into which since March, 1931, the flood flows of the Ware River have been diverted whenever required to fill the reservoir, flows through the Wachusett Aqueduct, a tunnel and masonry conduit about 9 miles long, into an open channel about 3 miles long to the Sudbury Reservoir. From the Sudbury Reservoir, the greater part of the supply is carried through Weston Aqueduct, about 12 miles in length, which leads from the dam at the Sudbury Reservoir directly to the Metropolitan District and which terminates in the town of Weston on the opposite side of the Charles River from Norumbega Park in the city of Newton. About 1 mile from the terminus of the Weston Aqueduct, Weston Reservoir, which forms a part of the aqueduct, stores about 1½ days' supply at the present rate of consumption of the district. From the terminus of this aqueduct, pipe lines lead to Chestnut Hill Reservoir and to Spot Pond. The Weston Aqueduct is insufficient to alone provide for district needs until inverted pipe siphons crossing the Sudbury Reservoir and Happy Hollow in Framingham and Wayland are increased in capacity by providing the additional parallel pipe lines originally planned for this aqueduct. The pipe lines leading from the Weston Aqueduct Terminal to Chestnut Hill and elsewhere in the district are also insufficient in capacity.

At present about 80 per cent of the water supply is normally delivered through Weston Aqueduct and the remainder through Sudbury Reservoir to Reservoir No. 3 in Framingham and thence through pipe lines to the dam at Reservoir No. 1, from which the Sudbury Aqueduct extends about 17½ miles to Chestnut Hill Reservoir. In case the Weston Aqueduct is for any reason out of service, it is necessary to supplement the capacity of the Sudbury Aqueduct by using the Cochituate Aqueduct, which takes water from Lake Cochituate in the towns of Natick, Wayland and Framingham.

Hopkinton and Whitehall reservoirs of the Southern Sudbury System are piped to the Sudbury Reservoir and Ashland Reservoir to the Sudbury Aqueduct, and these reservoirs also may be used if required in emergencies.

Reservoirs Nos. 1 and 2 on the South Sudbury and Cochituate Lake are exposed to serious pollution from drainage areas with relatively dense populations, have not been in use since the last prolonged dry period of 1930-31 and should be abandoned for water supply as soon as other adequate works are provided. The new works being built by the Metropolitan District Water Supply Commission for supplying water from Quabbin Reservoir on the Swift River are nearing completion, and filling of this reservoir may begin within a year. As soon as storage in this reservoir begins, the flood flows of the Ware River will be stored therein and the combined yields of Wachusett Reservoir, the Ware River and Quabbin Reservoir will alone be sufficient to supply the prospective needs of the Metropolitan District for a long time in the future, estimated to be at least until the year 1970.

As soon as storage in Quabbin Reservoir is available, the water supply of the district should be taken directly from Wachusett Reservoir, into which the Ware and Quabbin Reservoir supplies are brought through the 25-mile Quabbin Aqueduct tunnel, and works should be provided for by-passing all the Sudbury sources, which sources, however, should to the extent necessary be held in reserve for emergency use.

While the present water supply has been made safe by the liberal use of chlorine, the sanitary protection of the entire Sudbury and Cochituate watersheds has long been a serious problem. Water leaving the Wachusett Reservoir reaches the masonry section of the Wachusett Aqueduct in excellent condition and thence flows through the open channel some three miles and through the Sudbury Reservoir, a further distance of about 3 miles to the Sudbury Dam. Large dairies along

the open channel and near the upper end of the reservoir, the large population of the city of Marlborough and the town of Southborough and various industrial establishments contribute to the run-off into the water supply.

An impressive factor showing the relative purity and safety of water from the various sources of supply and demonstrating the importance of eliminating from use the Cochituate and Sudbury sources except in extreme emergencies is relative density of population in the various watersheds which is as follows:

Cochituate	1,223 per square mile
North Sudbury	550 per square mile
South Sudbury	230 per square mile
Wachusett	74 per square mile
Ware	34 per square mile
Quabbin	8 per square mile

The increasing population on Wachusett Watershed is a matter of immediate concern and sanitary works should now be provided at West Boylston, Gates Brook, parts of Holden and elsewhere in order to adequately protect the water supply.

In order to discontinue the use of the Sudbury Supply except in emergencies the following works should be built as soon as possible: (1) A pressure aqueduct, preferably all in pressure tunnel, connecting the terminal chamber of the Wachusett Aqueduct with the end of the Sudbury Aqueduct at Sudbury Dam; (2) An enlargement of the two siphons of the Weston Aqueduct to the full capacity of the masonry aqueduct; (3) A pressure tunnel extending from the easterly end of the Weston Aqueduct to Chestnut Hill Reservoir; (4) A pipe line connecting the influent and effluent pipes at Spot Pond. With the completion of these works the water from Wachusett Reservoir will be delivered at Chestnut Hill at an elevation about 60 feet higher than the present water surface and the use of Chestnut Hill Reservoir, the adequate sanitary protection of which is extremely difficult if not practically impossible, will be no longer necessary except in emergencies. Spot Pond, the principal distributing reservoir from the northerly portion of the Metropolitan Water District is equally vulnerable from the standpoint of sanitary protection, and the pipe line above proposed at Spot Pond should be provided to connect the influent pipe entering the south end of the pond with the effluent pipe at the pumping station, thus eliminating this pond from regular use.

With the completion of the above works, excellent water from the best sources only will be furnished the Metropolitan District, and the works now proposed would be designed to later become a part of a future distribution system by which water will be distributed through a pressure aqueduct, preferably a pressure tunnel, the entire distance from Wachusett Aqueduct Terminal Chamber, (Sudbury Reservoir and Weston Aqueduct remaining for emergency use) and water in the district will be distributed by extending the pressure tunnel, proposed for immediate construction from Weston Aqueduct Terminal Chamber to Chestnut Hill, through Boston and the northern part of the district and back to the terminal chamber forming a loop, connection into the distribution system being made at the various shafts. Water would thus be delivered from Wachusett Reservoir at an elevation sufficient to eliminate all but 5 per cent of the present pumping; and Chestnut Hill and Spot Pond reservoirs would be eliminated. By such a system, further construction of large mains in congested streets with attendant hazards will no longer be required; more adequate and dependable fire protection will be secured; most of the pumping will be eliminated; and the system will have maximum security from malicious attack.

Attention is also directed to the desirability of now increasing the size of the Metropolitan Water District by establishing such rules and conditions of admission as will encourage communities in need of additional or better water supplies to join and thus enjoy the privileges of an excellent and adequate supply and at the same time assume a part of the cost of the works to be mutual advantage of all.

The report of the Metropolitan District Water Supply Commission and the Department of Public Health upon needed improvements in the distribution system and adequate prevention of pollution of the sources of water of the Metropolitan Water District, dated December 1, 1937, under Chapter 48 of the Resolves of 1936, and printed as House No. 262, 1938, is worthy of careful attention and the recommendations therein should be adopted.

The shallowness of the upper reaches of the Charles River Basin near the Watertown and Newton line has deterred boating through that beautiful winding portion of the stream. Dredging is necessary and the Commission is desirous that funds be made available to improve the present conditions. An attractive boat landing has been built near Watertown Square and if a deeper channel were available the present motor boat excursion and passenger service now operating in the lower Basin could be made operative to the Watertown Bridge.

The Sewerage Division, under the jurisdiction of this Commission, handles not only the sanitary sewage from the Metropolitan Sewerage District, but also substantial amounts of surface and roof water and in some cases unreasonably large amounts of infiltration. The maintenance costs of the sewerage works are assessed upon the various municipalities in the sewerage district in proportion to their respective populations. This apportionment is inequitable because some of the communities have separated their systems and have constructed relatively tight local sewers while others have failed to provide storm drainage systems or construct local sanitary sewers which are relatively free from infiltration.

Aside from the disproportionate assessment of maintenance costs for services rendered in handling sewage, there is a future consideration which should be discounted at the present time, namely—the treatment of sewage entering Boston Harbor. If the various municipalities fail to separate their storm sewage from their sanitary sewage, then sewerage works substantially more expensive than have been contemplated will be necessary if certain rivers are to be made free from pollution from surcharged sanitary sewers which are allowed to overflow into them when the capacity of the mains is overloaded.

Suitable devices should be provided by the Metropolitan District Commission for measuring the flow of sewage entering the sewerage systems of the North and South Metropolitan Districts from each city and town in the districts, and consideration should be given to amending Chapter 92 of the Tercentenary Edition of the General Laws to provide that, for maintenance costs, the cities and towns of the North and South Metropolitan District, be assessed according to the quantities of sewage discharged from each municipality into the North and South Metropolitan Sewerage Systems.

VI. Special Investigations

In accordance with Chapter 20 of the Resolves of 1937, the Metropolitan District Commission was required to make an investigation and report relative to the making of further improvements at Malibu Beach, located westerly of the Old Colony Parkway in the Dorchester district of the city of Boston. The report is printed as House No. 179.

In accordance with chapter 40 of the Resolves of 1937, the Metropolitan District Commission was required to make an investigation and report relative to the improvement of the Charles River Meadows, and the extension of the Veterans of Foreign Wars Parkway into the town of Dedham. The report is printed as House No. 180.

In accordance with Chapter 43 of the Resolves of 1937, the Metropolitan District Commission was required to make an investigation and report relative to the construction of a traffic circle at the intersection of the West Roxbury Parkway and Grove Street in the town of Brookline. The report is printed as House No. 181.

In accordance with Chapter 54 of the Resolves of 1937, the Metropolitan District Commission was required to make an investigation and report of the following matters:

1. Construction of a building for a bath house at Gerry's Landing in Cambridge.
2. Installation of traffic lights at the junction of Revere Beach Parkway and Webster Avenue in Chelsea.
3. Dredging and improving Hemenway's Pond in the town of Milton.
4. Construction of a public lavatory on Winthrop Shore Drive in the town of Winthrop.
5. Construction and maintenance of a bath house at Lake Quannapowitt in the town of Wakefield.
6. Advisability of the acquisition for reservation purposes of property in that part of the town of Nahant commonly known as Bass Point.

A complete report of these matters is printed as House No. 182.

In accordance with Chapter 75 of the Resolves of 1937, the Metropolitan District Commission was required to make an investigation and report of the following matters:

1. Construction of an overpass at or near the intersection of Memorial Drive, Cottage Farm Bridge and Brookline Street, in the city of Cambridge.
2. Reconstruction and widening of a portion of Revere Beach Parkway in the cities of Medford and Everett, and making certain other improvements in connection therewith.
3. Reconstruction and widening of the highway and railroad bridge between the Revere Beach Parkway and North Shore Road in the city of Revere.

A complete report of these matters is printed as House Bill 184.

In accordance with Chapter 42 of the Resolves of 1937, the Metropolitan District Commission, and the Department of Public Health, acting as a joint board, were required to investigate and report relative to the construction of additional sewers in the North and South Metropolitan Sewerage Districts. A complete report is printed as House No. 187.

VII. Police Department

During the past year the following changes occurred in the personnel of the Metropolitan District Police:

Officer Thomas F. White, who was appointed to the force June 1, 1909, died on May 27, 1937. Officer John Shea, appointed October 7, 1918, died on July 9, 1937.

Captain Albert Chapman, who was in charge of the Charles River Lower Basin Division, was retired on November 15, 1937, having reached the age of 70. He was appointed to the force on April 23, 1902. Sergeant Earl S. Chainey, appointed July 29, 1896, was retired January 7, 1937. Sergeant Charles H. Gardner, appointed May 9, 1906, was retired June 17, 1937. Officer Michael J. Bresnan, appointed July 18, 1906, was retired January 7, 1937. Officer James E. Maloney, appointed June 20, 1910, was retired October 21, 1937.

Captain Henry P. Hayes was promoted to the rank of Deputy Superintendent on June 7, 1937, and assigned to duty at headquarters. Lieutenant Thomas J. Kelleher was promoted to Captain on November 15, 1937 and was placed in charge of the Charles River Lower Basin Division. Sergeant Arthur C. Cadegan was promoted to Lieutenant on July 2, 1937. Sergeant John D. MacKinnon was promoted to Lieutenant on November 26, 1937. Four officers were promoted to Sergeants and three men were appointed as regular patrolmen during the year.

At the end of 1937 the force was as follows:

1	Superintendent
1	Deputy Superintendent
6	Captains
6	Lieutenants
21	Sergeants
188	Patrolmen
1	Policewoman
6	Vacancies (Patrolmen)

230 Total

Lost and stolen property, the total value of which was \$46,356.38, was recovered and returned to the owners.

7,297 hours of extra duty, without compensation, were performed by members of the force to care for visitors at special functions, such as handling the crowds at football games, concerts, regattas, races, etc. 328 ambulance and 398 patrol wagon calls were answered during the year.

The department had 2,921 cases before the various courts during the year. Not included in the court cases were 65 cases of wayward girls and women which were handled by the policewoman, without court action. Several of the girls apprehended had been reported as runaways. Of the cases before the courts, 1,153 were for offences against the General Laws, 946 for Motor Vehicle Law violations and

822 for offences against the Metropolitan District Commission Rules and Regulations. Of the Motor Vehicle Law violations, 206 cases were for operating under the influence of intoxicating liquor and 109 cases of driving so as to endanger the lives and safety of the public. Of the offences against the Metropolitan District Commission Rules and Regulations, there were 161 violations of the General Rules, 108 violations of the Auto Rules and 553 violations of the Speed Regulations. Fines totalling \$19,948 were assessed by the courts. A detailed listing of the above cases may be found in Appendix No. 3.

The morale and discipline of the department, in general, has been excellent, although it was necessary to prefer charges against one permanent regular officer and one call officer during the year.

During January and February the department was drilled in marching according to United States Army regulations under Deputy Superintendent Henry R. Hayes as Drillmaster and Captain Thomas J. Kelleher as Assistant Drillmaster. These drills were preceded by lectures on Criminal Law, Court Procedure, First-aid, instructions in the use of Firearms and Gas Equipment, given by superior officers of the department and others.

During the year, twenty-eight talks concerning the activities of the department were given by the Superintendent and the Deputy Superintendent before Rotary and Kiwanis clubs, church organizations, American Legion and Veterans of Foreign Wars Posts, Civic and Fraternal bodies.

On September 17, 1937, the Commissioner, upon the request of His Honor, Mayor Mansfield and the Constitution Day Committee of the City of Boston, detailed one Deputy Superintendent, three Lieutenants, nine Sergeants, seventy-four patrolmen marching in infantry formation, two wagons with patrolmen drivers, five motorcycle patrolmen and six mounted horse-patrolmen, to participate in the parade on Constitution Day. This detail led the parade, made a very fine showing and occasioned much favorable comment from press and public.

Upon the invitation of the town of Brookline Constitution Day Committee, a detail of one Deputy Superintendent, two Lieutenants, six Sergeants, forty-eight patrolmen in infantry formation, four motorcycle officers and five mounted horse-patrolmen, led the parade on October 3, 1937, in that town.

Again, On October 27, 1937, acceding to the request of His Honor, Edward W. Kenney, Mayor of the City of Woburn, upon the occasion of the monster parade and reception to the new National Commander of the American Legion, Daniel J. Doherty, the following detail led the parade in that city: one Deputy Superintendent, three Lieutenants, eight Sergeants, five mounted horse-patrolmen and forty-eight patrolmen marching in infantry formation. Upon request of Chief Charles R. McCauley of Woburn, the above detail relieved local officers of Woburn, Winchester, Stoneham, Wakefield and members of the State Police Patrol in policing the route of the parade, particularly during the exercises held in the square in front of City Hall, said local officers having been on duty since early morning.

VIII. Metropolitan Water District and Works

The Water District now includes 20 municipalities with an area of about 174 square miles and a population, as of July 1, 1937, of 1,574,610. The Water Works lands include an area of about 19,000 acres, of which about 2,000 acres have been planted with pine trees.

The works under the control of the Water Division include 9 storage reservoirs with 200 square miles of tributary watershed, a total storage capacity of 80 billion gallons and water surface of 8,600 acres; 60 miles of aqueducts; 2 hydro-electric power stations with a combined capacity of 7,000 horsepower; 16 miles of high-tension power transmission line; 6 distribution pumping stations with a combined equipment of 7,900 horse power and pumping capacity of 346 million gallons a day; 13 distribution reservoirs with a capacity of 2.5 billion gallons and 177.51 miles of distribution mains. The consumption of water from the Metropolitan Water Works during the year by the 18 municipalities entirely supplied was 47,756,817,000 gallons, equivalent to an average daily consumption of 130,840,600 gallons or 90 gallons per capita for a population of 1,456,210 in the district supplied.

CONSTRUCTION

Improvements for Belmont, Watertown and Arlington

At the beginning of the year the work of improving the Intermediate High Service System was well advanced. At the reservoir on Arlington Heights, the work which was nearly completed had been suspended for the winter. At the pumping station on Alexander Avenue in Belmont, the work was in progress and about one-third completed and the shop work on the pumping equipment had been completed.

On March 3 the work of installing the pumping equipment in the station was begun. The reservoir was completed May 22; the pumping equipment was ready for operation early in June and by June 8, when the pumps were first operated, the station had been completed with the exception of a few minor details.

In April and May, 6,900 linear feet of underground electric cable was installed between the pumping station and the reservoir by James Sugden Company, to provide for the automatic operation of the pumping equipment.

In July, 1,010 linear feet of galvanized steel chain link fence, 72 inches in height, was erected to enclose the reservoir lands on Arlington Heights and in August, 397 linear feet of steel picket fence, 56 inches in height, was erected to enclose the pumping station lot in Belmont. These fences were furnished and erected by the West End Iron Works of Cambridge, under Contract No. 74-M.

The expenditures for the Intermediate High Service Works during 1937 amounted to \$44,767.59, making a total expenditure of \$282,101.66 for the new works to December 31, 1937.

The official efficiency tests of the electrically-operated centrifugal pumping units at the Belmont Pumping Station were made July 14 and July 15 with the following results:

ITEMS		Unit No. 21 Four hours 11:00 A.M. to 3:00 P.M. July 14	Unit No. 22 Three hours 12:30 P.M. to 3:30 P.M. July 15
Observed head by differential mercury gage,	(feet)	159.60	156.49
Velocity head—calculated,	(feet)	6.86	6.96
Total head pumped against,	(feet)	166.46	163.45
Temperature of water,	(degrees Fahrenheit)	70.7	70.8
Water pumped—by meter,	(gallons)	534,000	402,000
Water pumped—rate,	(million gallons per day)	3.20	3.22
Water pumped,	(pounds)	4,446,700	3,347,000
Work done	(foot pounds)	740,200,000	547,130,000
Electric energy used,	(kilowatt hours)	355.13	259.88
Electric energy used,	(foot pounds)	943,010,000	690,090,000
Efficiency,	(per cent)	78.49	79.28

Reinforcement of Low Service Pipe Lines

The work of V. J. Grande Company of Boston, under Contract No. 114, for laying 10,225 linear feet of 48-inch steel water main in Everett and Chelsea, which was suspended December 19, 1936, was resumed March 4, 1937 and was continued until December 22 when work was suspended for the winter. All of the pipes had been laid and the trenches backfilled, but on account of the cold weather the Contractor was obliged to defer some of the work of replacing the permanent street pavement until spring, when weather becomes favorable for this work. The value of the work done under this contract during the year is \$255,619.75. The pipe line extends from Norwood Street at Winthrop Street in Everett to Cross Street at Park Street in Chelsea, and at both of these places it has been connected with the existing Metropolitan water mains by the Distribution Section force which has also flushed out and sterilized the new main and put it into condition for regular service.

In May, Contract No. 118, amounting to \$42,236.30, was made with the Warren Pipe Company of Mass. Inc. of Boston for furnishing cast-iron pipes and specials and Contract No. 119, amounting to \$16,748.39, was made with the Walsh Holyoke Steam Boiler Works, Inc. of Holyoke for furnishing 42-inch electric-welded flanged steel water pipes for the proposed tunnel under the Malden River.

August 24 two contracts, No. 120 and No. 121, were made with V. Barletta Company of Boston for completing the remaining portion of the 48-inch main for

reinforcing the low service supply in Everett, Chelsea and East Boston. The portion of the new main included in Contracts No. 120 and No. 121 extends for a distance of 6,025 linear feet from the existing Metropolitan main in Third Street at Middlesex Avenue in Medford to a connection with the westerly end of the section of this new main, laid under Contract No. 114 in Winthrop Street near Norwood Street in Everett. Of this distance, 3,370 feet is through private lands in which an easement to use for Water Works purposes has been acquired, and 385 feet is at the crossing of the Malden River where a tunnel is being constructed by the pneumatic process under Contract No. 120. At the end of the year about 80 per cent of the work under Contract No. 120 was completed and the value thereof was \$79,905.00.

Under Contract No. 121, about 30 per cent of the work was completed at the end of the year and the value thereof was \$64,409.47. Most of the additional work of changing underground structures in connection with Contract No. 121 was done by this Division with a temporary day labor force instead of in the usual manner by the Contractor at cost, plus 15 per cent.

Under Contract No. 123 with the Samuel J. Tomasello Corporation of Boston, dated September 14, an area of 765 square yards of special type pavement was resurfaced in Norwood Street, Everett, in connection with the construction of the new 48-inch main at a cost of \$1,063.35.

MAINTENANCE

Precipitation and Yield of Watersheds

The annual precipitation of 52.09 inches on the Wachusett watershed is 6.45 inches above the average for the past 41 years, and the precipitation of 8.44 inches recorded in November is the maximum for that month during the period covered by our observations. For the Sudbury watershed the annual precipitation of 46.76 inches is 2.19 inches above the average for the past 63 years and for the Cochituate watershed the annual precipitation of 46.46 inches is 1.47 inches above the average for the past 75 years.

The average daily yield per square mile of the watersheds was 1,357,400 gallons for the Wachusett, 1,124,200 gallons for the Sudbury and 1,068,400 gallons for the Cochituate. These yields are above the average by nearly 23 per cent on the Wachusett and 15 per cent on the Sudbury and Cochituate watersheds.

Storage Reservoirs

The capacities of the storage reservoirs of the Metropolitan Water Works, the elevation of the water surfaces and the quantity of water stored in each reservoir at the beginning and at the end of the year are shown by the following table:

STORAGE RESERVOIRS	Eleva- tion ¹ *	Total Capacity (Gallons)	JAN. 1, 1937		JAN. 1, 1938	
			Eleva- tion ¹ of Water Sur- face	Available Storage (Gallons)	Eleva- tion ¹ of Water Sur- face	Available Storage (Gallons)
Cochituate Watershed:—						
Lake Cochituate . . .	144.36	2,097,100,000	143.38	1,768,300,000	142.97	1,672,380,000
Sudbury Watershed:—						
Sudbury Reservoir . . .	260.00	7,253,500,000	258.07	5,196,600,000	257.38	4,914,120,000
Framingham Res. No. 1 .	169.32	289,900,000	168.06	141,640,000	167.90	134,700,000
Framingham Res. No. 2 .	177.12	529,900,000	176.38	448,040,000	176.26	442,880,000
Framingham Res. No. 3 .	186.50	1,180,000,000	184.95	875,050,000	184.70	855,100,000
Ashland Reservoir . . .	225.21	1,416,400,000	224.46	959,100,000	224.51	961,850,000
Hopkinton Reservoir . .	305.00	1,520,900,000	303.33	965,930,000	304.20	1,019,800,000
Whitehall Reservoir . . .	337.91	1,256,900,000	336.93	759,860,000	337.40	850,500,000
Wachusett Watershed:—						
Wachusett Reservoir . . .	396.50	67,000,000,000	389.38	46,566,740,000	393.64	52,145,380,000
Totals	—	82,544,600,000	—	57,681,260,000	—	62,996,710,000

¹Elevation in feet above Boston City Base.

*Full reservoir with flashboards on overflow.

The total storage capacity shown in the third column of the table is to the bottom of the reservoirs. The available storage shown in columns 5 and 7 is the quantity that can be conveniently used for consumption.

Wachusett Reservoir

The water in the Wachusett Reservoir was about 5.6 feet below the normal high-water line, elevation 395, at the beginning of the year. It rose about 5 feet during January and remained within half of a foot of high-water line until March 14 when it rose rapidly and with water overflowing at the waste way was more than a foot above high-water line on March 23. The maximum elevation 396.73 and storage of 67,316,400,000 gallons was recorded on May 18 and the water was then held at about elevation 396.50 until June 23.

During the filling period 7,221,800,000 gallons of water overflowed from the reservoir into the river below the dam. From June 23 to November 13 the water went down at the rate of about 2 feet a month and on the latter date reached the lowest stage during the year, elevation 386.78 and the minimum storage of 54,265,600,000 gallons. After November 13 the water rose and at the end of the year was at elevation 393.64 and there was then 63,145,400,000 gallons of water stored in the reservoir.

There was discharged into the Wachusett Reservoir watershed, in January, 1,011,100,000 gallons of water from the Ware River watershed, and in the first 6 months and the last month of the year 2,620,000,000 gallons of water from the Asnebumskit Brook watershed, which originally drained into the Wachusett Reservoir but from which the City of Worcester now diverts so much of the yield as it can utilize for its supply. The city also has the right to divert water from the Quinapoxet Pond watershed, which is also tributary to the Wachusett Reservoir, but has not yet diverted any water from this area.

Between July 23 and December 3 the town of Clinton pumped 112,498,200 gallons of water from the reservoir for its water supply, under the provisions of Acts of 1923, Chapter 348, and also pumped 16,401,800 gallons for the water supply of the town of Lancaster, for which payment should be made by the town of Lancaster to the Commonwealth, in accordance with the provisions of Acts of 1936, Chapter 299.

During the year 535,500,000 gallons of water was discharged from the reservoir into the Nashua River, in accordance with the provisions of General Laws, Chapter 92, Section 14. This water is in addition to the overflow from the reservoir in the spring.

The Water Works lands, waters, structures and other property of the Water Division at the reservoir and on the watershed have been maintained and operated in the usual manner and are now in good condition.

The wooden board fence on the westerly side of the State Highway which crosses the reservoir on the causeway in West Boylston was replaced with a cobble stone masonry wall for a distance of 825 feet by the joint operations of the town and the State Department of Public Works.

During the year 650 square feet of Water Works land was sold to the town of Clinton for highway purposes in connection with the reconstruction of the Chestnut Street Bridge over the Nashua River; about 28,300 square feet in 4 parcels was sold to the town of West Boylston for highway purposes in connection with the reconstruction of Temple Street and about 7,400 square feet was sold to the town of Sterling for highway purposes in connection with the construction of Fitch Pond Road. In July, 0.95 of an acre of Water Works land was sold to the town of Sterling for its water supply system and as part payment therefor the town conveyed 0.09 of an acre of land to the Commonwealth.

Sudbury Reservoir

At the beginning of the year the water in Sudbury Reservoir was about a foot below the crest of the spillway at the dam, which is at elevation 259.00. The water was maintained approximately at that elevation until April 1, when the flashboards were put on the spillway. From April 1 to October 17 while the flashboards were on the spillway, the water in the reservoir varied through a range of several feet with a high of 260.19 on April 23 and a low of 257.90 on August 2. After the flashboards were removed, the water in the reservoir during the remainder of the year averaged about 1.40 feet below the crest of the spillway.

On April 23 and 24 a total of 6,000,000 gallons of water overflowed from the reservoir into Framingham Reservoir No. 3 on account of an unexpected yield from heavy rains, and on April 26 and 27 and June 9 and 10, a total of 111,600,000 gallons of water was by-passed at unit No. 1 into the Weston Aqueduct while repairs and adjustments were being made. With these exceptions all of the water drawn from the reservoir was used to generate electric energy.

A new 5-ton, spur-gearied, chain hoist was installed in the head house at the Weston Aqueduct to handle the screens.

The Water Works lands and structures at this reservoir were maintained in the usual manner.

Framingham Reservoir No. 3

All of the water drawn through the Sudbury Aqueduct for supplying the town of Framingham and the Metropolitan Water District was taken from Framingham Reservoir No. 3, in which the water was maintained at a convenient elevation by discharging water into it from Sudbury Reservoir, as required.

At times of abundant yield, water was also discharged into the reservoir from the Sudbury Reservoir and wasted into the Sudbury River in order to improve the quality of the water supplied to the District, and a total of 4,324,800,000 gallons was wasted in this manner during the year, and in addition, 1,253,100,000 gallons of water overflowed from this reservoir due to heavy rainfall in March.

All of the Water Works property at this reservoir has been given the usual attention.

Ashland, Hopkinton and Whitehall Reservoirs and South Sudbury Pipe Lines and Pumping Station

No water was drawn from the Ashland, Hopkinton or Whitehall reservoirs for consumption during the year, but they were kept well filled with water and all of the water not required for that purpose was wasted. The South Sudbury Pipe Lines and Pumping Station were not used during the year as an ample supply of water of better quality was available from the Wachusett and North Sudbury watersheds.

All of these reservoirs and works have been kept ready for use in case of emergency.

During the year, about 32,200 square feet of Water Works land was sold to the town of Hopkinton and 565 square feet was sold to the town of Westborough for eliminating the Fruit Street and Flanders Road grade crossing of the Boston and Albany Railroad. An exchange of 0.25 of an acre of Water Works land for 0.24 of an acre of land and a right-of-way owned by Marion Emerson and Irene Anderson, in Southborough, was made to shorten the boundary fence and to obtain convenient access to the remaining Water Works land.

Framingham Reservoirs Nos. 1 and 2 and Farm Pond

On account of the poor quality of the water in Framingham Reservoirs Nos. 1 and 2 and Farm Pond, they are no longer used for water supply purposes and the yield from their watersheds was allowed to waste into the Sudbury River below Dam No. 1, including the usual flow of 1,500,000 gallons per day which was maintained every day in the year, as required by Acts of 1872, Chapter 177.

During the year 26,656,300,000 gallons of water was wasted into the Sudbury River below Dam No. 1, the equivalent of 73,030,959 gallons per day. The maximum waste for any day was 253,000,000 gallons, on April 24.

In December the water in Framingham Reservoir No. 1 was drawn down about seven feet for the purpose of cleaning out the culvert under Salem End Road, taking out the dam at the end of the channel leading from the culvert into the reservoir, and removing weeds, lily pads and rushes from shallow areas.

The work of replacing the old iron bridge on Fountain Street over Reservoir No. 2 with a new single-span steel stringer bridge with reinforced concrete deck and fences was completed early in the year and later in the year the old wooden fence on Fountain Street was replaced with a new two-plank rail fence with concrete posts.

During the year, the town of Framingham pumped 211,296,000 gallons of water from its filter galleries on the shore of Farm Pond and under legislative authority the Boston and Albany Railroad took approximately 15,000,000 gallons and the New York, New Haven and Hartford Railroad took approximately 11,500,000 gallons of water from the pond for use in locomotives.

Lake Cochituate

No water was drawn from Lake Cochituate for water supply purposes during the year, and to keep the water in the lake at the desired elevation, it was necessary to waste 6,444,500,000 gallons of water at the dam at the outlet.

The usual maintenance work has been done to keep the Water Works property at the lake in satisfactory condition.

AQUEDUCTS

The *Wachusett Aqueduct* was used on 289 days during the year, the total time in service amounting to 123 days, 14 hours and 39 minutes, and the quantity of water discharged from the Wachusett Reservoir into the aqueduct was 43,536,100,000 gallons, equivalent to an average draft of 119,277,000 gallons per day for the entire year, and all of the water was used to generate electric energy at the Wachusett power station before it was discharged into the aqueduct.

During the year the Westborough State Hospital pumped 92,382,000 gallons of water from the aqueduct terminal chamber in Marlborough equivalent to an average of 253,100 gallons per day.

Brush, grass and weeds were mowed and disposed of for a distance of 10 miles along the aqueduct at a cost of \$288 per mile. The structures on the line of the aqueduct have been cared for in the usual manner.

The *Weston Aqueduct* was in use 365 days, the total time in service amounting to 363 days, 4 hours, and 11 minutes, and the total quantity of water drawn from the Sudbury Reservoir into the aqueduct for delivery into the Weston Reservoir was 40,160,900,000 gallons. No water was wasted from the aqueduct during the year.

Brush, weeds and grass were mowed and disposed of along the entire width of the right-of-way from gaging chamber No. 1 in Framingham to the west portal of tunnel No. 4 in Wayland.

All manhole covers, iron and wood work in the gaging and siphon chambers were scraped and painted and the department house at the White Place in Nobscot was painted.

The *Sudbury Aqueduct* was in continuous use during the year, except for three short periods of time to allow inspection and cleaning. The aqueduct was shut down for the above purpose 19½ hours January 18 and 19; 8½ hours on January 26; and 24 hours on April 14 and 15. The actual time that the aqueduct was in use was 362 days, 20 hours and 15 minutes. The entire supply for this aqueduct, 7,072,395,000 gallons, was drawn from Framingham Reservoir No. 3, and of this quantity 286,195,000 gallons was sold to the town of Framingham and 6,786,200,000 gallons, equivalent to an average of 18,592,329 gallons per day, was delivered to Chestnut Hill distribution reservoir. No water was diverted to Lake Cochituate from the aqueduct during the year.

Grass, weeds and brush were mowed and disposed of at the aqueduct lands between Hollis Street, Framingham and Grant Avenue, Newton.

The buildings along the aqueduct received the usual care. The iron fences on Echo Bridge were painted one coat at a cost of \$120.00 for labor and \$67.62 for material. The old wooden fence at the Chestnut Street entrance to Echo Bridge was removed and replaced with a new chain link fence at a cost of \$120.00 for labor and \$253.62 for material. The work of erecting this fence was done by the Water Division force.

The *Cochituate Aqueduct* was not used during the year but was kept in readiness for use in case of emergency.

The land along the aqueduct right-of-way has received the usual care. Grass, weeds and brush were mowed and disposed of from Lake Cochituate to the Newton Playground.

All of the structures along the aqueduct have been cared for in the usual manner.

PROTECTION OF THE WATER SUPPLY

A force, including a Sanitary Engineer, a Junior Sanitary Engineer, two Skilled Laborers and seven Watchmen, was employed to enforce the Sanitary Rules and Regulations on the watersheds; to apply copper sulphate to the waters in the reservoirs for removing objectionable tastes and odors, and to apply chlorine and ammonia for sterilizing the water, as distributed for consumption.

Water Division forces have operated throughout the year the filter beds on Beaman Street in West Boylston, where the sewage from the Worcester County Training School, occupied by about 50 persons, was purified, and the Gates Terrace filter beds at Sterling Junction, where sewage from cottages in that vicinity was purified. Sewage from the Eagleville Mill and the Mount Pleasant House in Holden, and from the St. Marks and Fay Schools and the Deerfoot Farm sausage factory and dairy and the Waveney Farm dairy in Southborough, was purified by privately-owned and operated plants.

The water entering Sudbury Reservoir from the small brook which drains the Cherry Street section of Fayville was chlorinated by the Water Division throughout the year.

Surface water from thickly settled drainage areas of 525 acres in the village of Sterling; from 1,280 acres along the brook near Maple Street in Marlborough; from 700 acres along Pegan Brook, and an intercepting ditch in Natick was purified by filters operated by Water Division forces before it flowed into the water supply, with the exception of an overflow of 15,188,000 gallons at the Pegan Brook settling basin, and of 69,344,000 gallons from the intercepting ditch in Natick, following heavy rains, which was sterilized with chlorine before it entered the reservoirs.

At the Pegan Brook filters the pumping station was operated on 258 days and 216,584,000 gallons of water was pumped to the filters, an average of 593,381 gallons a day for the entire year. The cost of operating the station and caring for the grounds and filter-beds was \$6,357.46 for labor, \$432.14 for fuel and \$61.43 for supplies and repairs, a total of \$6,851.03, which is at the rate of \$31.63 per million gallons filtered. The fuel cost per million foot gallons was \$0.20.

The cost of protecting the water supply by filtration was \$1,144.00 for the Wachusett, \$10,374.73 for the Sudbury and \$6,851.03 for the Cochituate watershed.

During the year about 32,400 pounds of copper sulphate, which cost about \$1,595.00, was applied to the water in two of the storage reservoirs and to the Weston Aqueduct, also to two of the distribution reservoirs as an algaecide to destroy microscopic organisms including *Dinobryon*, *Synura* and *Uroglenopsis*, which occurred in sufficient numbers to give the water an unpleasant taste and odor.

Algaecide was applied to the water in the storage reservoirs, as follows:

At Sudbury Reservoir in October to about 7,194,000,000 gallons of water; the total amount of copper sulphate used was about 20,500 pounds.

At Framingham Reservoir No. 3 in July and again in October to about 800,000,000 gallons of water; the total amount of copper sulphate used was about 2,515 pounds.

At the Weston Aqueduct in October to about 424,000,000 gallons of water as it flowed from the Sudbury Reservoir into the Weston Aqueduct; the total amount of copper sulphate used was 1,122 pounds.

Algaecide was applied to the water in the distribution reservoirs, as follows:

At Spot Pond in April to about 1,736,000,000 gallons of water; the total amount of copper sulphate used was about 6,230 pounds.

At Chestnut Hill Reservoir in July, when the reservoir contained about 655,500,000 gallons of water, about 1,950 pounds of copper sulphate was used.

The amount of copper sulphate applied varied from a minimum of 2.6 pounds to a maximum of 3.6 pounds per million gallons of water.

All water drawn from the storage reservoirs for use in the Water District was sterilized before it was delivered into the distribution system.

The water drawn through the Sudbury Aqueduct was sterilized in Sherborn near Leland Street at the Framingham boundary line, and the water drawn through the

Weston Aqueduct was sterilized at the screen chamber at the outlet of the Weston Reservoir. From January 1 to August 1, liquid chlorine only was used at these places in sufficient quantity to produce a sterile water with a trace of residual chlorine at the point where it was delivered to the distribution pipes.

On account of some unsatisfactory results from the analyses of samples of water drawn from the local pipes at some places in Boston during the hot weather, the State Department of Public Health recommended that more chlorine be used for sterilizing the water in order to carry a chlorine residual in the water as delivered to the consumers. In order to accomplish this result it was necessary to apply anhydrous ammonia to the water before the chlorine was applied. For this purpose an ammoniator was operated on the Sudbury Aqueduct in Leland Street and 3 ammoniators were operated at the screen chamber in Weston, after July 31.

During the year, there was used in the Sudbury Aqueduct 41,730 pounds of liquid chlorine, an equivalent of 6.15 pounds per million gallons of water and from July 31 to the end of the year, there was used 7,700 pounds of anhydrous ammonia, an equivalent of 2.41 pounds per million gallons of water. The cost of the chlorine was \$1,840.00 and of the ammonia \$1,220.00.

During the year there was used at the screen chamber in Weston, 214,750 pounds of liquid chlorine, equivalent to 5.40 pounds per million gallons of water and from July 31 to the end of the year there was used 30,160 pounds of anhydrous ammonia, equivalent to 1.78 pounds per million gallons of water. The cost of the chlorine was \$8,945.00 and of the ammonia \$4,286.00.

Portions of the water supply which had passed through open distribution reservoirs after the primary sterilization were again sterilized by chlorine as follows:

Water which had passed through the open distribution reservoirs at Chestnut Hill, after the primary chlorination, was again chlorinated at the Chestnut Hill pumping stations, where 35,500 pounds of liquid chlorine was used for the secondary chlorination of 16,548,005,000 gallons of water, equivalent to 2.15 pounds per million gallons.

Water which had been exposed in Spot Pond, after the primary chlorination, was again chlorinated at the Spot Pond Pumping Station, where 11,450 pounds of liquid chlorine was used for the secondary chlorination of 4,460,362,300 gallons of water, equivalent to 2.57 pounds per million gallons.

Portions of the water pumped at the Chestnut Hill stations were chlorinated for a third time, after being exposed in the open high service reservoirs on Fisher Hill in Brookline and on Waban Hill in Newton, where 4,660 pounds of chlorine and 400 gallons of Merclor were used for sterilizing the water.

From August 18 to the end of the year, all water flowing out of Spot Pond at the east gate house for the low service district was sterilized with 1,060 gallons of Merclor.

For sterilizing all of the water supplied during the year, there was used 309,470 pounds of liquid chlorine, 38,660 pounds of anhydrous ammonia and 1,460 gallons of Merclor and the total cost of these chemicals was \$18,620.00.

Improved brook channels, ditches, culverts and watering places were maintained in good order. The cost of maintaining 35 miles of drainage ditches on all of the watersheds was \$6,773.00.

For the protection of the water supply 7.87 acres of land in Boylston was acquired from Samuel C. and Elizabeth J. Butterfield on August 5.

The work of diverting the water of East Waushacum Pond in Sterling, authorized by Acts of 1934, Chapter 346, was begun July 12, 1935 in co-operation with the town of Clinton as a Federal Emergency Relief Administration Project and was continued in 1936 as a Federal Works Progress Administration Project until December 7, when work was suspended for lack of Federal and Water Division funds; there then remained 401 linear feet of 18-inch pipe to be laid and a small concrete dam to be built. The work was in progress from April 7 until June 16, 1937, when the additional Federal and town funds became exhausted. On June 18 work was again resumed by the Water Division with additional funds appropriated by the Commonwealth and was then continued and completed July 26. The total cost of the entire work was in excess of \$67,000.00, of which the Federal Government furnished \$56,378.00 for labor, the Water Division \$8,616.35 for labor, materials and plant rentals and the town of Clinton an unknown amount for

materials, supplies, plant rentals and transportation of forces. The diversion works were first put into service on November 1.

During the year written permits were issued to 1,689 inhabitants of the Metropolitan Water District and of the towns in which certain Water Division reservoirs are located, giving them the right to fish from the shores of the reservoirs under conditions specified in the permits. Of these permits 819 were for fishing in the upper portion of the Wachusett Reservoir more than 2 miles above the outlet and the remainder were for fishing in Whitehall Reservoir, Lombard Mill Pond and Framingham Reservoir No. 2, from which no water was drawn for consumption.

CLINTON SEWAGE DISPOSAL WORKS

The works constructed under the provisions of Acts of 1898, Chapter 557, for disposing of the sewage of the town of Clinton, were operated on 365 days during the year. The quantity of sewage pumped and disposed of averaged 1,639,000 gallons per day. The cost of operating the pumping station was \$4,196.85, which is \$7.02 per million gallons, equivalent to \$0.140 per million foot gallons. The cost of operating the filters and intercepting sewer was \$10,641.84, which is \$17.79 per million gallons of sewage disposed of.

FORESTRY

The plantings made during the year included 101,000 red and white pine transplants in the Wachusett Section and 1,000 white pine transplants, 15,000 arbor vitae and 630 spruce trees in the Sudbury Section.

The total expenditure for forestry in 1937 was \$33,554.23, of which \$7,246.00 was expended for protecting the trees from insects.

HYDROELECTRIC SERVICE

The generation and sale of electric energy as a by-product in connection with the operation of the Metropolitan Water Works was provided for in Acts of 1895, Chapter 488. The Wachusett hydroelectric power station, constructed in 1911, is believed to be the first plant where a public water supply was utilized in this manner.

The hydroelectric power stations at the Wachusett Dam in Clinton and at the Sudbury Dam in Southborough are operated by the water drawn for water supply from the reservoirs above these dams.

During the year 14,378,770 kilowatt hours of electric energy was developed at the power stations.

The value of the energy delivered in 1937 at contract prices was \$88,054.05 and deducting \$61,565.53, the expenditures charged to the operation of both stations and the Water Division transmission line, there was a profit of \$26,488.52.

Wachusett Station

The power station was operated on 289 working days during the year, being idle on 14 days on account of water requirements, and on Sundays and holidays.

The statistics are as follows:

Total energy developed (kilowatt hours)	9,160,400
Energy used at power station and storage yard (kilowatt hours)	33,505
Available energy (kilowatt hours)	9,126,895
Water used (gallons)	43,536,100,000
Average head (feet)	96.04
Energy developed per million foot gallons (kilowatt hours)	2.191
Efficiency of station (per cent)	69.72
Credits:	
Energy sold New England Power Company and Boston Edison Company:	
8,903,552 kilowatt hours at \$0.00625	\$55,647.20
Deduction of 2 per cent as provided in contract:	
178,071 kilowatt hours at \$0.00625	1,112.94
	\$54,534.26

Energy furnished Clinton Sewerage Pumping Station:		
223,343 kilowatt hours at \$0.00625	\$1,395.89	
Charges:		
Superintendence	\$2,752.47	
Labor, operating station	9,481.72	
Repairs and supplies	702.31	
Transmission line repairs and supplies	5,846.65	
		\$55,930.15
Taxes	\$18,783.15	
Administration, general supervision, interest and sinking fund	5,075.00	
	11,429.73	
Profit		\$35,287.88
Cost of available energy per thousand kilowatt hours		\$3,866

Sudbury Station

The Sudbury power station was operated on 365 days during the year with three shifts, although on several days the station was shut down for a short period on account of repairs.

The statistics are as follows:

Total energy developed (kilowatt hours)	5,218,370	
Energy used at power station (kilowatt hours)	78,546	
Available energy (kilowatt hours)		5,139,824
Framingham Reservoir No. 3 service:		
Water used (gallons)		11,204,400,000
Average head (feet)		65.47
Weston Aqueduct service:		
Water used (gallons)		40,049,300,000
Average head (feet)		38.72
Energy developed per million foot gallons (kilowatt hours)		2.284
Efficiency of station (per cent)		72.7
Credits:		
Energy sold Boston Edison Company:		
5,139,824 kilowatt hours at \$0.00625		\$32,123.90
Charges:		
Superintendence	\$1,822.56	
Labor, operating station	15,506.08	
Repairs and supplies	523.44	
		\$17,852.08
Taxes		2,188.60
Administration, general supervision, interest and sinking fund		6,236.97
		26,277.65
Profit		\$5,846.25
Cost of available energy per thousand kilowatt hours		\$5.113

DISTRIBUTION PUMPING STATIONS

At the five distribution pumping stations, which are operated by steam power, 22,448,837,576 gallons of water was pumped during 1937. This is 943,233,653 gallons less than was pumped in 1936.

The pumpage at the two stations at Chestnut Hill included 14,195,090 gallons for the low service, on account of a break in a 48-inch supply main in Newton, and 16,533,809,930 gallons for the southern high service. The southern high service pumpage includes 71,857,000 gallons for a portion of the supply of the town of

Brookline, 29,570,000 gallons for the city of Newton and 644,884,115 gallons, which was repumped at the Hyde Park Station for the southern extra-high service.

At the Spot Pond Station 4,460,362,298 gallons was pumped for the northern high service and at the Arlington Station 795,586,143 gallons was pumped for the northern extra-high service.

By arrangement with the city of Newton 332,310,000 gallons of water was repumped from the southern high service between October 27, 1936 and June 16, 1937 by the city at its Ward Street booster station for use on the high lands in Belmont and Watertown where satisfactory service could not be furnished from the Chestnut Hill stations, and for this pumping the Commonwealth paid the city \$4,872.18.

On June 8, the new electrically-operated pumping station in Belmont was put into regular service for supplying the high lands in Belmont and on June 16, for supplying the high lands in Watertown, formerly supplied from the southern high service by the city of Newton booster station on Ward Street. The total pumpage at the Belmont Station from June 8 to the end of the year was 232,626,000 gallons.

During the year 7,741,204 pounds of bituminous coal, 802,283 pounds of anthracite screenings and 1,286,401 gallons of Bunker C fuel oil were burned at the five pumping stations operated by steam power.

In addition to the usual miscellaneous repairs made at all of the stations to keep the equipment in dependable condition, some renewals and minor improvements have been made during the year as follows:

At Chestnut Hill Station No. 1 boilers Nos. 20, 21 and 22 were retubed.

At Chestnut Hill Station No. 2 new feed water heater was purchased and was being installed at the close of the year.

At Spot Pond Station the engine room and boiler room roofs, gutters, conductors and flashings were repaired and wood cornice of the engine room roof was painted. Boiler No. 23 was retubed and top head stays were renewed.

At the Arlington Station boilers Nos. 13, 14 and 19 were retubed.

At Hyde Park Station boilers Nos. 7 and 18 were retubed.

A large amount of miscellaneous work was done at the Carpenter, Blacksmith and Machine shops at Chestnut Hill for the Pumping Service and other Sections of the Water Division.

DISTRIBUTION RESERVOIRS

The locations, elevations and capacities of the distribution reservoirs of the Metropolitan Water Works are shown by the following table:

DISTRIBUTION RESERVOIRS AND LOCATIONS	Elevation of High Water ¹	Capacity in Gallons
Low Service:		
Spot Pond, Stoneham and Medford	163.00	1,791,700,000
Chestnut Hill Reservoir, Brighton district of Boston	134.00	300,000,000
Weston Reservoir, Weston	200.00	200,000,000
Mystic Reservoir, Medford	157.00	26,200,000
Northern High Service:		
Fells Reservoir, Stoneham	271.00	41,400,000
Bear Hill Reservoir, Stoneham	300.00	2,450,000
Northern Extra High Service:		
Arlington Reservoir, steel tank, Arlington	442.50	2,000,000
Southern High Service:		
Fisher Hill Reservoir, Brookline	251.00	15,500,000
Waban Hill Reservoir, Newton	264.50	13,500,000
Forbes Hill Reservoir, Quincy	192.00	5,100,000
Forbes Hill Standpipe, Quincy	251.00	330,000
Southern Intermediate High Service:		
Arlington Covered Reservoir	320.00	2,000,000
Southern Extra High Service:		
Bellevue Reservoir, steel tank, West Roxbury district of Boston .	375.00	2,500,000
Total	-	2,402,680,000

¹Elevation in feet above Boston City Base.

The Mystic and Forbes Hill reservoirs have been kept full of water for an emergency but were not used during the year.

The Bradlee basin of the Chestnut Hill Reservoir was in service throughout the year but the Lawrence basin was out of service from August 3 until December 19, inclusive, because of objectionable condition of the water therein.

The new Intermediate High Service Reservoir in Arlington was put into service on June 8.

All other distribution reservoirs were in regular service throughout the year.

The standpipes on Arlington Heights, Bellevue Hill and Forbes Hill were in service throughout the year.

DISTRIBUTION PIPE LINES

The portion of the new 20-inch Intermediate High Service pipe line, extending from the new pumping station on Alexander Avenue in Belmont to the new covered reservoir on Arlington Heights, was put into regular service on June 8.

During the year three breaks occurred in the distribution pipe lines, one on April 19 in the 30-inch northern high service main in Cross Street in Malden, one on December 14 in the 24-inch low service main in Broadway in Chelsea and one on December 17 in the Weston Aqueduct 48-inch supply main in Blake Street in Newton. The cost of repairing all of these breaks was \$1,511.06, of which sum \$781.36 will be charged to the city of Newton on account of the Blake Street break which was caused by an excavating machine operated by city employees.

Considerable damage was caused by the break in the 30-inch main in Malden,—\$2,409.10 was paid to the city of Malden for repairing damage to streets and sewers; the Water Division expended \$1,134.55 for pumping out cellars and repairing lawns and other private property, and \$1,536.37 was paid to settle claims for damages to private property. Although the break in the 48-inch main in Newton caused considerable damage, the city of Newton has repaired the streets, pumped out flooded cellars and cleaned up the silt and mud that covered the flooded areas.

During the year 16 leaks in the distribution pipe lines were repaired at a cost of \$1,335.16.

The steel girder on the easterly side of the pipe bridge over the Fitchburg Division of the Boston & Maine Railroad at Massachusetts Avenue, North Cambridge, was replaced with a new girder at a cost of \$1,775.00.

In January a connection was completed between the 48-inch southern high service main and the new Booster Pumping Station at Reservoir Road near Boylston Street in Brookline, the entire expense being paid by the town.

There are now 95 Venturi meters, varying in size from 6 to 60 inches in diameter in the distribution pipe lines; 76 of these are on the connections with the various municipalities in the Metropolitan Water District regularly supplied from the Metropolitan Water Works; 5 are used for measuring the water delivered by the Weston Aqueduct supply mains; 7 are used in connection with the operation of 5 of the Department pumping stations; there is 1 on a cross connection between the southern high and low service mains; there are 3 on emergency connections with city of Newton mains, 2 on emergency connections with city of Cambridge and town of Wakefield water mains, and 1 measures the water supplied for the State Institutions in Waltham. There are also 11 disc and 16 detector meters in use for measuring small quantities of water supplied at various places.

There are 9 pressure regulating valves connected with the system, 7 of which are in constant use for reducing pressure of water supplied to Revere, Swampscott and Winthrop.

Recording pressure gages have been maintained at 38 places on the distribution system and tables in the Appendix show the hydraulic grade at 18 of these stations, as determined by the charts.

Pipes, specials and other materials and supplies required for maintaining and operating the pipe lines are kept on hand at the Glenwood pipe yard in Medford and the Chestnut Hill pipe yard in Brighton.

Auto trucks equipped with gate-operating attachments have been maintained with men on duty ready to operate them in case of emergency at any time during the day or night.

CONSUMPTION OF WATER

During the year 47,756,817,000 gallons of water was furnished to the 18 cities and towns that receive their entire supply from the Metropolitan Water Works. This is equivalent to an average daily consumption of 130,840,600 gallons and for the estimated population of 1,456,210 is at the rate of 90 gallons per capita.

The consumption for the town of Brookline, with a population of 51,810, is divided into two services, the high service for the year consuming 1,305,584,000 gallons and the extra high service consuming 421,034,000 gallons, making a total for the town of Brookline for the year of 1,726,618,000 gallons, equivalent to an average daily consumption of 4,730,500 gallons and 91 gallons per capita per day, of which 71,857,000 gallons was furnished from the Metropolitan Works.

The city of Newton, with an estimated population of 66,590, used from its local source 1,694,327,000 gallons of water. In addition to this consumption from its local source, the city was supplied with 29,570,000 gallons of water from the Metropolitan supply, making the total consumption of the city 1,723,897,000 gallons, equivalent to an average daily consumption of 4,723,000 gallons or 71 gallons per capita.

The amount of water furnished the city of Newton from the Metropolitan supply is 16,070,000 gallons in excess of the quantity which the city is entitled to take free of charge under the agreement made in 1900 when the Waban Hill Reservoir was purchased from the city, and for this water the city will pay \$2,058.41.

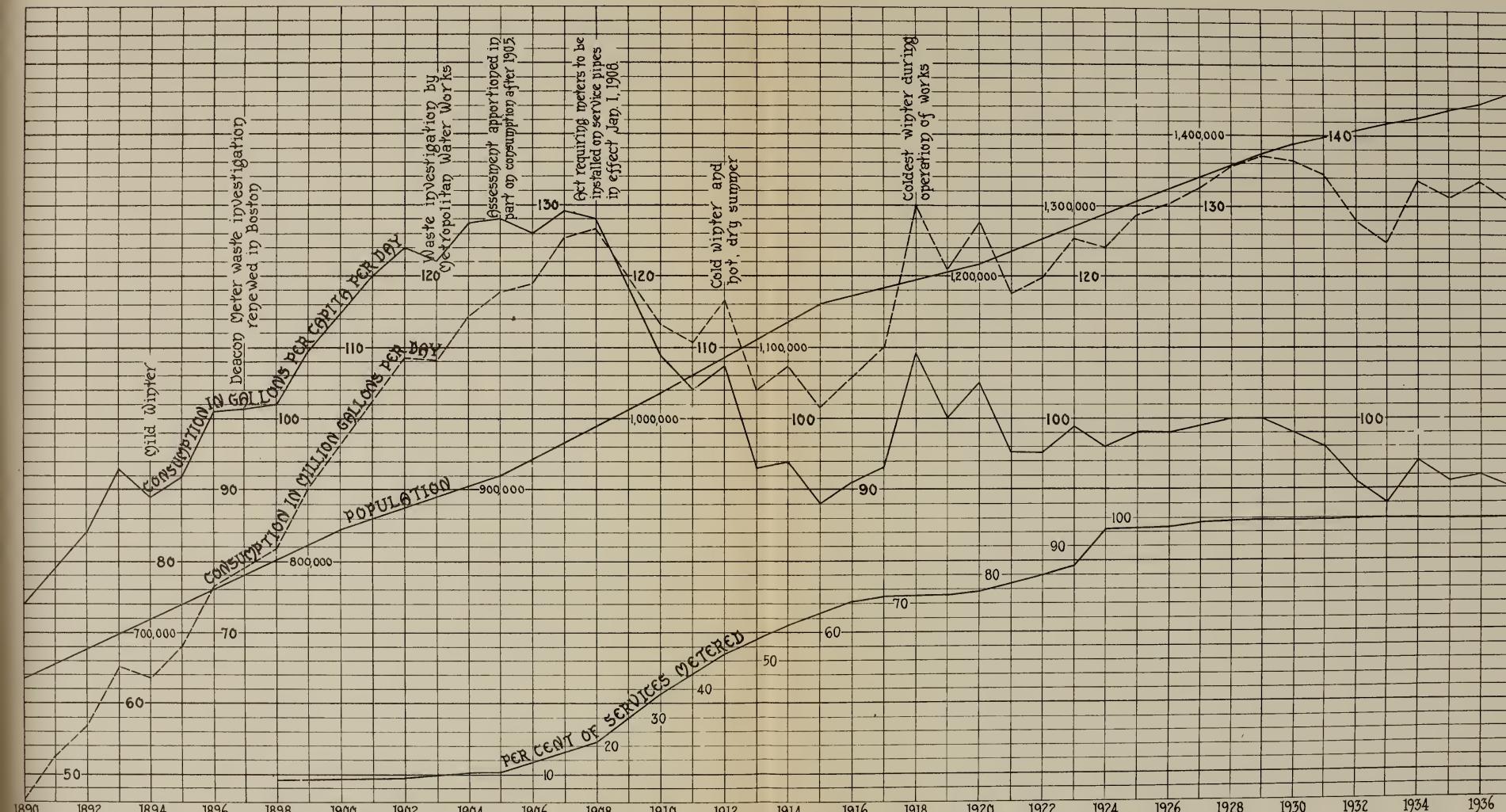
The population, consumption of water and per cent of services metered in the Metropolitan Water District as supplied in 1937 and for the period from 1890 to 1937, inclusive, are shown graphically by the accompanying diagram.

The average daily consumption of water in each of the municipalities in the Metropolitan Water District during 1936 and 1937 is as follows:

Estimated Popula- tion, 1937		AVERAGE DAILY CONSUMPTION				Decrease in Gallons	
		1936		1937			
		Gallons	Gallons per Capita	Gallons	Gallons per Capita		
Arlington	39,830	2,196,900	56	2,375,900	60	179,000 ¹	
Belmont	26,450	1,383,900	54	1,391,300	53	7,400 ¹	
Boston	836,940	90,112,100	109	88,144,700	105	1,967,400	
Chelsea	41,010	3,240,100	78	3,030,700	74	209,400	
Everett	46,610	4,553,600	97	4,790,400	103	236,800 ¹	
Lexington	11,510	667,500	59	652,700	57	14,800	
Malden	56,880	3,912,800	69	3,951,300	69	38,500 ¹	
Medford	62,350	3,290,100	53	3,211,200	52	78,900	
Melrose	24,840	1,517,300	62	1,450,600	58	66,700	
Milton	19,050	1,005,300	54	1,043,300	55	38,000 ¹	
Nahant	1,800	217,500	122	227,300	126	9,800 ¹	
Quincy	79,510	5,306,200	68	4,628,500	58	677,700	
Revere	35,130	2,135,500	61	2,232,800	64	97,300 ¹	
Somerville	99,110	9,351,600	94	9,077,600	92	274,000	
Stoneham	11,250	692,500	63	623,000	55	69,500	
Swampscott	10,550	852,000	81	718,500	68	133,500	
Watertown	36,320	2,058,000	57	2,091,800	58	33,800 ¹	
Winthrop	17,070	1,155,500	68	1,199,000	70	43,500 ¹	
District Supplied	1,456,210	133,648,400	92	130,840,600	90	2,807,800	
Brookline	51,810	4,845,900	95	4,730,500	91	115,400	
Newton	66,590	4,989,800	75	4,723,000	71	266,800	
Total District	1,574,610	143,484,100	92	140,294,100	89	3,190,000	

¹Increase:

POPULATION, CONSUMPTION OF WATER, AND PER CENT OF SERVICES METERED
 IN THE
 METROPOLITAN WATER DISTRICT
 AS SUPPLIED IN 1937
 FROM 1890 TO 1937



Note: Estimated population and consumption per capita given on diagrams published in previous annual reports are revised from time to time as regular census figures become available.

The consumption by districts in 1937 as compared with 1936 is as follows:

	Gallons per Day 1937	DECREASE FROM 1936	
		Gallons per Day	Percent- age
Low service district, embracing the low-service districts of Arlington, Belmont, Boston, Chelsea, Everett, Malden, Medford, Somerville and Watertown	67,938,000	757,000	1.10
Southern high-service district, embracing Quincy, the high-service district of Boston, except East Boston, and portions of Milton and Watertown	45,007,900	1,833,800	3.91
Intermediate high-service district, embracing portions of Belmont and Watertown	1,267,600	230,700	15.40
Northern high-service district, embracing Melrose, Nahant, Revere, Stoneham, Swampscott, and Winthrop and the high-service districts of Chelsea, East Boston, Everett, Malden, Medford and Somerville	12,536,400	221,300	1.73
Southern extra high-service district, embracing the higher portions of Hyde Park, Milton and West Roxbury	1,873,400	57,000 ¹	3.14 ¹
Northern extra high-service district, embracing Lexington and the higher portions of Arlington and Belmont	2,217,300	178,000 ¹	8.73 ¹
District Supplied			
Brookline and Newton	130,840,600 9,453,500	2,807,800 382,200	2.10 3.89
Total District	140,294,100	3,190,000	2.22

¹Increase.

WATER FROM METROPOLITAN WATER WORKS SOURCES USED OUTSIDE OF THE METROPOLITAN WATER DISTRICT—1937

PLACES WHERE WATER IS USED	Total Quantity (Gallons)	Average Quantity (Gallons per Day)	Amount Charged
Town of Rutland	86,003,700 ^a	235,600	—
Town of Holden	25,769,100 ^b	70,600	—
Town of Clinton	112,498,200	308,200	—
Town of Lancaster	16,401,800	45,000	000.00
Town of Sterling	4,597,000 ^c	12,600	—
Westborough State Hospital	92,382,000	253,100	\$2,771.46
Town of Westborough	73,000,000	200,000	—
Town of Southborough	24,719,800	67,700	—
Town of Ashland	111,562,000	305,600	—
Town of Hopkinton	28,561,000	78,200	—
Town of Framingham	492,467,000	1,349,200	11,652.52
Town of Natick	310,850,000	851,600	—
United States Army Reservation at Peddock's Island in Hull	604,000 ^d	1,700	72.65
Portion of Town of Saugus	3,114,000 ^e	8,500	—
Metropolitan Parks, Middlesex Fells and Revere Beach Divisions	6,661,000	18,200	—
Walter E. Fernald State School and Metropolitan State Hospital	160,583,000 ^f	440,000	16,281.51

NOTES.—Water was used throughout the year in all places except as noted.

The average daily use is in all cases figured on basis of 365 days.

^aAll but 403,900 gallons diverted from the watershed.

^b224,400 gallons diverted from the watershed.

^c574,600 gallons diverted from the watershed.

^dWater supplied by the Commission through City of Quincy pipes, and by agreement revenue is divided in equal shares between the City and Commonwealth.

^eThe City of Melrose supplies the water and pays the Commonwealth by an addition to its regular apportionment.

^fFor fiscal year ending November 30.

Information regarding the Water Division contracts made and pending during 1937 and the usual Water Works statistics are given in the accompanying tables.

IX. Metropolitan Sewerage Districts

AREAS AND POPULATIONS

The populations of the districts, as given in the following table, are based on the census of 1935.

Table showing Ultimate Contributing Areas and Present Estimated Populations within the Metropolitan Sewerage Districts, as of December 31, 1937

	CITY OR TOWN	Area (Square Miles)	Estimated Population
North Metropolitan District	Arlington	4.73	40,090
	Belmont	3.78	27,560
	Boston (portions of)	3.45	95,215
	Cambridge	5.43	120,870
	Chelsea	2.07	40,680
	Everett	2.92	46,480
	Lexington	15.98	11,660
	Malden	4.16	56,800
	Medford	6.11	62,530
	Melrose	3.81	24,950
	Reading	9.76	11,290
	Revere	5.55	35,090
	Somerville	3.96	98,780
	Stoneham	4.27	11,330
	Wakefield	6.36	16,610
	Winchester	5.31	13,780
	Winthrop	1.61	17,100
	Woburn	12.23	19,860
		101.49	750,675
South Metropolitan District	Boston (portions of)	24.96	331,750
	Braintree	13.44	18,010
	Brookline	5.35	52,100
	Canton	17.84	6,940
	Dedham	9.66	15,520
	Milton	9.59	19,240
	Needham	11.44	12,450
	Newton	16.00	66,680
	Norwood	10.16	15,910
	Quincy	11.46	80,020
	Stoughton	16.23	8,650
	Walpole	20.81	7,560
	Waltham ¹	11.40	44,100
	Watertown	3.83	36,410
	Wellesley	9.89	14,600
	Weymouth	16.46	22,300
		208.52	752,240
Totals		310.01	1,502,915

¹Including 2710 in the Metropolitan State Hospital and the Middlesex County Tuberculosis Hospital authorized by Chapter 372 of the Acts of 1928 and Chapter 373 of the Acts of 1929.

Metropolitan Sewers

SEWERS PURCHASED AND CONSTRUCTED AND THEIR CONNECTIONS

During the year there have been 2.586 miles of Metropolitan sewers built within the sewerage districts, so that there are now 151.209 miles of Metropolitan sewers. Of this total, 9.642 miles of sewers, with the Quincy Pumping Station, have been purchased from cities and towns of the districts. The remaining 141.567 miles of sewers and other works have been constructed by the Metropolitan Boards.

The locations, lengths and sizes of these sewers are given in appendix tables, together with other data referring to the public and special connections with the systems.

Maintenance

SCOPE OF WORK AND FORCE EMPLOYED

The maintenance of the Metropolitan Sewerage System includes the operation of 10 pumping stations, the Nut Island screen-house and 151.209 miles of Metropolitan sewers, receiving the discharge from 2104.25 miles of town and city sewers at 1471 points, together with the care and study of inverted siphons under streams and in the harbor.

At present the permanent maintenance force consists of 196 men, of whom 117 are employed on the North System and 79 on the South System. These are subdivided as follows: North Metropolitan System, 77 engineers and other employees in the pumping stations and 40 men, including foremen, on maintenance, care of sewer lines, buildings and grounds; South Metropolitan System, 53 engineers and other employees in the pumping stations and 26 men, including foremen, on maintenance, care of sewer lines, buildings and grounds.

The regular work of this department, in addition to the operation of the pumping stations, has consisted of routine work of cleaning and inspecting sewers and siphons, caring for tide gates, outfall sewers, regulators and overflows, measuring flow in sewers, inspection of connections to the Metropolitan sewers, and the care of pumping stations and other buildings, grounds and wharves.

In addition to these regular duties, other work has been done by the maintenance employees in this department as follows:

Deer Island Pumping Station

At this station, the shaft on No. 3 pump and the hub of the impeller wheel to which it was keyed became so corroded and so much play developed in the connection, it was thought advisable to make repairs. The shaft was removed and the taper end increased in size by welding and then refitted to the hub.

The inside walls of the fire room were painted.

An outside contractor drove piles and rebuilt the platform and box supporting and protecting the suction pipe for the condensing water pumps for No. 3 and 4 engines.

An 8-inch drain pipe carrying rain water from the roof and wash water from the floor of the boiler room and discharging on the beach was extended for a distance of 12 feet by the outside maintenance men in order to prevent the burying of the end of the pipe by tidal action.

At the barn, general repairs were made by our outside maintenance men including new foundations, reshingling of the roof with asphalt shingles, painting, etc. A locker room for the maintenance men, a tool room and a garage for the truck were thus provided.

The floating stage was pulled out and blocked up for the winter.

East Boston Pumping Station

At this station, a cracked guide on No. 1 engine was repaired by bolting on an outside patch. A new brass box was made and installed for the crosshead bearing on the high pressure cylinder and a new discharge line was installed on the siphon between No. 1 and 2 engines.

The crosshead pin on the high pressure cylinder on No. 2 engine was turned down and the boxes rebabbitted, a new stud was put in on the crank pin boxes on the high pressure cylinder, new valves were put in on the siphon, the condenser pump was repaired by replacing fifteen valves and springs and the check valve for the discharge line having been found to be cracked and not opening properly was removed and replaced by a new one.

The crosshead pin on the low pressure cylinder of No. 3 engine was refitted, a new wrist pin was made and installed on the cut-off mechanism and new brass boxes were put in on the dashpot. The main shaft on the engine was repacked and the spool on the rocker arm of the circulating pump welded. Eight new valves and springs replaced old ones in the air pump. The oil pump was repacked. This engine was shut down in May and the pump examined. The impeller was found to be considerably worn but the cut-water put in two years ago was in good condition.

The crosshead pin on the high pressure cylinder of No. 4 engine was turned down and the boxes rebabbitted. Springs were replaced on the condenser pump and an oil cup installed on the plunger pump. The casing of No. 4 pump was removed and new sleeves put in on the shaft and the quarter boxes repaired. New discharge lines were put in on the siphons of all four engines. New extension rods for oil cups were made and installed for all three crossheads of all four engines.

A new wrist pin, wedge and stud were made and put in on No. 3 light engine and a new wrist pin and boxes made and installed on No. 2 light engine. New bearings were installed on the cylinder oil pump of No. 3 light engine.

The rods in the front screen of the pair nearer Chelsea Creek were renewed.

The economizer was taken apart and cleaned and the relief valve and economizer engine repaired.

New grates were put in No. 3, 4, 5 and 6 boilers.

Cracks around the fire doors of No. 1, 2, 3 and 4 boilers have been welded.

Two new heads were made and put on the duplex circulating pump which is now in good condition.

The boiler feed-water heater was taken apart and the broken coil replaced by a new one.

On five 8-inch valves on steam line, the handwheels have been replaced by wheels operated by a rim chain long enough to be within reaching distance of floor, allowing the valves to be opened or closed without placing and climbing a ladder in each case.

On the Holly System a pipe above the roof near the entrance to the chimney was repaired, a new piece of pipe and a new valve was put in the line in the screenroom, a new pipe was installed in the main steam line in the engine room, some other pipes of the system were replaced by new pipe, and a new drain was put in on the dead end of the blow-down line leading to No. 2, 4 and 6 boilers.

A new pipe was put in the roof drain running through the boiler room.

A new strainer was put in on the 12-inch salt-water suction line.

During November, No. 2 boiler was dismantled and removed to make room for a new one soon to be installed.

The maintenance men have rebuilt the platform and box supporting and protecting the suction line for condenser pumps for No. 1 and 2 engines. In some cases the piling was cut off and spliced.

They also drove sheeting to enclose a foundation for the extension of the condenser suction pipe at the westerly end of the station.

They assisted in setting up the second-hand mortising machine and second-hand jointer in the carpenter shop and in making repairs to No. 4 pump at the East Boston Pumping Station.

A new length of pipe was put in and a steam coil repaired in the carpenter shop.

A motor little used in the machine shop was transferred to the carpenter shop and set up to operate the jointer above mentioned.

The new tubes for the economizer at the Deer Island Pumping Station were unloaded from the freight car in Lynn by the East Boston maintenance men and delivered at Deer Island.

Charlestown Pumping Station

At this station, No. 1 and 2 boilers have had their masonry settings repaired and fire boxes relined by contract.

The salt-water well outside the station was cleaned by the maintenance men.

The fire-boxes of No. 3 and 4 boilers were relined with firebrick. Windows and casings, removed to allow recent placing of new boilers, were replaced during the month of May.

A new bearing with metallic packing was installed on No. 3 pump.

The condenser pump of No. 1 engine was relined and a new piston and piston rod put in. The steam chest on one of the dynamo engines was rebushed. Some rods in the screens were renewed.

Alewife Brook Pumping Station

At this station, the high pressure sides of No. 2 and 3 engines were reconditioned and a new valve stem put in on the low pressure side of No. 2 engine.

No. 2 feed pump, No. 2 vacuum pump and No. 2 air pump were overhauled and reconditioned.

A new steam main of extra heavy pipe was put in on the line to the boiler feed pumps with a new valve and a new connection with the main steam line and then covered with magnesia pipe covering.

Repairs and new parts were made for the water gauges for the boilers.

Carpentry repairs were made to the gable of the portico at the main entrance, which was found to be badly decayed.

Reading Pumping Station

The armature shaft of the larger motor was taken out and the collector rings which were badly worn were turned down. On replacing the shaft, new brushes were put in. The bearing at the pump was renewed and the check valve repaired.

One of the screens has been largely renewed, rods, hoisting brackets, etc., having been replaced.

Sewer Lines

Sewers in Belmont, Cambridge and Arlington have been cleaned and stop-planks removed and replaced in a manhole on Section 108 of the new Relief Sewer just north of the Mystic Valley Parkway to assist contractors in placing or removing bulkheads made necessary by the construction of the new North Metropolitan Relief Sewer. A considerable amount of sand was removed from the Belmont Relief Sewer.

Furniture was moved from some of the Field Engineers' offices.

A rough fence was put up at Canal and Prescott Streets, Medford, to prevent possible driving across Commission property onto the Railroad tracks.

Siphons have been cleaned at the Mystic River and Metropolitan Water Pipe Crossings of Section 107 of the new Relief Sewer.

A large amount of time has been spent in skimming off and removing a malodorous scum from the surface of the upper Mystic Lake and the Aberjona River, and the shores have been cleaned. An additional force of 10 temporary men was employed at this work for a little over two weeks. The iron pipes carrying the Cross Street Sewer through the new Relief Sewer, Section 114, and the Metropolitan Sewer through the new Relief Sewer a few hundred feet south of the Cross Street line have been taken out.

The Cross Street Sewer from the Mystic Valley Sewer to the junction with the Metropolitan Sewer was cleaned. Stop-planks were put in and removed at the sand-catcher at the junction of the Reading Extension, Metropolitan and North Woburn Sewers, for the benefit of contractors working on Section 112 of the new sewer.

Trenches have been refilled in Stoneham where settlement occurred over the line of the new Relief Sewer.

This work was done by our maintenance force. Our men also assisted the State Department of Health in putting up gauges in the sewers.

Ward Street Pumping Station

At this station, the boilers and black iron work have been painted.

The large doors on the northeast end of the fire room have been replaced. The old doors having been so large as to be unmanageable at times were replaced by smaller doors, the remaining area being filled by a transom and side lights. The whole framework was not fixed permanently in place, but was fitted, dovetailed and screwed in place so that the entire frame can be removed and replaced intact when boilers are renewed.

A condenser water manhole was sealed and then vented by a 1½-inch pipe carried to a height above the roof of the screen house. This was done to eliminate offensive odors.

A new supply shed was built measuring 15 by 20 feet. This takes the place of the old shed which consisted of three very old inspectors' field offices standing end to end and laid on mud sills.

A new blow-off tank for the boilers was installed in an improved location.

Quincy Pumping Station

At this station, the carpenters have built a new landing platform and stairs.

Braintree-Weymouth Pumping Station

The railing around the platform and catwalk at this station is almost complete. This was made by the machinist at the Nut Island Screen House.

Squantum Pumping Station

The automatic control system at this station went out of order so that the sewage rising in the sewers overflowed in the station toilet and rose to within a foot or less of the ceiling of the first basement. To avoid damage from this source in the future, a laborer is now stationed there during the daylight hours of every week day acting as watchman.

Sewer Lines

During construction of a roadway along the southerly side of the Neponset River in Milton, 8 feet of earth fill was placed over the High-level Sewer near the corner of Brush Hill Road and Brook Road. This is a W.P.A. project, under the supervision of the Massachusetts Department of Public Works, and no permission was given by this department for making this fill. No damage to the Metropolitan Sewer has resulted from this construction.

During January of this year, we received a complaint from a resident of the Germantown section of Hough's Neck, Quincy, to the effect that the construction of Section 122 of the South Metropolitan System had damaged a dike on his property, upon which dike he relied to keep tide-water from overflowing part of his property. This complaint being reasonable, the maintenance force repaired the dike during the month of March by building it higher, covering it with sods of marsh grass cut in the vicinity and facing the bay side with riprap, consisting mostly of old granite paving blocks obtained without cost. This work required the labor of 4 men for 4 days.

At the request of the City of Newton, 3 manhole frames in California Street were lowered so that there would be less jarring of traffic passing over them. These 3 manholes were all 2 inches higher than the surface of the street. At the time of the construction of this sewer, the manhole covers were made with a much greater convexity than those of the present standard. At the request of the City, we placed a 30-inch manhole cover of the flat, sidewalk type, on a regulator manhole frame in California Street, belonging to the City of Newton, but carrying a cover marked M E T.

During the month of November, 11 manholes which had become covered or were in danger of being covered, were raised to meet new street grades. These included 1 in Sea Street, Quincy, and 5 in Brook Road, Milton, which had been buried for many years. The others comprised 1 in the High School athletic field, just off Brook Road, in Milton; 2 in Canton just below Washington Street; 1 just off Blue Hill Avenue in Milton; and 1 just off Pleasant Street in Norwood.

Early in December, a section of the Neponset Valley Sewer in Cedar Grove Cemetery collapsed. This is part of a brick sewer acquired from the City of Boston and known to be in bad condition for some time. The section was originally in embankment but had been covered with broken rocks from ledge blasting about two years ago. The collapsed section was 16 feet long and within a few feet of a pile section but not itself on piles. The break was not rebuilt because the invert was not sufficiently good to warrant a new brick arch. Instead, a timber roof was placed consisting of 6-inch by 6-inch cross timbers with 2-inch planking laid lengthways. The rock fill was then replaced.

The riprap around the siphon headhouse at Station O, Section 123 in Quincy, having been badly broken by settlement, repairs were made so that it is now in good condition. At the request of the owner of a house near the above-mentioned head-house, a small sea wall was built along the two exposed sides of the house to protect it from further damage resulting from erosion of the beach. This erosion seems to have been caused by the erection of the headhouse. This wall was built of granite stones and slabs obtained from the yard of the City of Quincy without cost to us.

A large gun projectile of 15-inch caliber, weighing 450 lbs. and of a very unusual design which was found on Prince's Head, Peddocks Island, has been turned over to this department and placed on Nut Island with the fragment of a gun

previously set up there. The gun and projectile are both of the period 1873-1876, when tests of guns and projectiles designed by Norman Wiard were made at Nut Island by the U. S. Navy and U. S. Army.

GASOLINE IN PUBLIC SEWERS

During the year the usual precautions have been maintained against the introduction of gasoline into the Metropolitan sewers. An inspector who covers both North and South Metropolitan Sewerage Districts has been employed. His duties are to see that all newly constructed garages or other gasoline-using establishments are supplied with a proper gasoline separator and also to see that these separators are kept in working condition.

During the year 1937 the number of permits issued by the municipalities in the Sewerage Districts for the construction of garages and other places where gasoline is used was 277. Each of these permits necessitates an examination by our inspector. Many of them are attended to through the mails and do not require a personal visit. Visits are made, however, to all locations where a connection is to be made with the public sewerage system and to such places as do not respond to the return postal cards sent out. During the year 39 such places were connected with the sewers that empty into the Metropolitan Systems. At the present time there are according to our records 1760 garages and other establishments where gasoline is used connected with the local sewerage systems which discharge into the Metropolitan sewers.

This system of inspection has improved the gasoline situation in regard to the danger to the sewers. Occasionally odors of gasoline are detected in the sewers. These are reported to the Department of Public Safety which alone has statutory control of the distribution and handling of gasoline in the Commonwealth.

PUMPING STATIONS

Capacities and Results

NORTH METROPOLITAN SYSTEM

Deer Island Pumping Station

At this station are four submerged centrifugal pumps with impeller wheels 8.25 feet in diameter, driven by triple-expansion engines of the Reynolds-Corliss type.

Contract capacity of 1 pump: 100,000,000 gallons, with 19-foot lift.

Contract capacity of 3 pumps: 45,000,000 gallons each, with 19-foot lift.

Average coal duty for the year: 57,400,000 foot pounds.

Average quantity raised each day: 84,500,000 gallons.

Maximum quantity raised per day: 151,200,000 gallons.

East Boston Pumping Station

At this station are four submerged centrifugal pumps, with impeller wheels 8.25 feet in diameter, driven by triple-expansion engines of the Reynolds-Corliss type.

Contract capacity of 1 pump: 100,000,000 gallons, with 19-foot lift.

Contract capacity of 3 pumps: 45,000,000 gallons each, with 19-foot lift.

Average coal duty for the year: 57,900,000 foot pounds.

Average quantity raised each day: 82,500,000 gallons.

Maximum quantity raised per day: 149,200,000 gallons.

Charlestown Pumping Station

At this station are three submerged centrifugal pumps, two of them having impeller wheels 7.5 feet in diameter, the other 8.25 feet in diameter. They are driven by triple-expansion engines of the Reynolds-Corliss type.

Contract capacity of 1 pump: 60,000,000 gallons, with 8-foot lift.

Contract capacity of 2 pumps: 22,000,000 gallons each, with 11-foot lift.

Average coal duty for the year: 53,300,000 foot pounds.

Average quantity raised each day: 45,800,000 gallons.

Maximum quantity raised per day: 69,300,000 gallons.

Alewife Brook Pumping Station

The pumping units in this station consist of one Andrews pump driven by a compound marine engine, one Morris pump and Morris compound engine and a specially designed engine of vertical cross-compound type having between the cylinders a centrifugal pump rotating on a horizontal axis.

Contract capacity of the Andrews pump: 4,500,000 gallons, with 13-foot lift.

Contract capacity of Morris pump: 8,000,000 gallons, with 15-foot lift.

Contract capacity of the special pump: 13,000,000 gallons, with 13-foot lift.

Average coal duty for the year: 30,000,000 foot pounds.

Average quantity raised each day: 8,700,000 gallons.

Maximum quantity raised per day: 12,900,000 gallons.

Reading Pumping Station

At this station are two submerged centrifugal pumps, one of 2,500,000 gallons per 24 hours, and one of 4,000,000 gallons per 24 hours, capacity. These operate against a maximum head of 65 feet, and are actuated by vertical shafts directly connected with 75 and 100 horse-power motors.

Alternating current of 440 volts furnished by the town of Reading is used.

Average quantity pumped per 24 hours: 1,600,000 gallons.

Maximum quantity raised per day: 3,800,000 gallons.

SOUTH METROPOLITAN SYSTEM

Ward Street Pumping Station

At this station are two vertical, triple-expansion pumping engines, of the Allis-Chalmers type, operating reciprocating pumps, the plungers of which are 48 inches

in diameter with a 60-inch stroke and one 50,000,000-gallon centrifugal pumping unit actuated by a 500 H.P. Uniflow engine.

Contract capacity of 3 pumps: 50,000,000 gallons each, with 45-foot lift.

Average coal duty for the year: 75,900,000 foot pounds.

Average quantity raised each day: 35,700,000 gallons.

Maximum quantity raised per day: 64,200,000 gallons.

Quincy Pumping Station

The plant at this station consists of one Lawrence centrifugal pump driven by a Sturtevant compound condensing engine, one Morris centrifugal pump driven by a Morris compound condensing engine, and one DeLaval centrifugal pump driven by a Fitchburg vertical uniflow engine.

Contract capacity of 3 pumps: Lawrence centrifugal, 10,000,000 gallons; Morris centrifugal, 10,000,000 gallons; DeLaval centrifugal, 15,000,000 gallons.

Average coal duty for the year: 34,400,000 foot pounds.

Average quantity raised each day: 7,500,000 gallons.

Maximum quantity raised per day: 24,700,000 gallons.

Nut Island Screen-house

The plant at this house includes two sets of screens in duplicate actuated by small reversing engines of the Fitchburg type. Two vertical tubular boilers, 80 horse-power each, operate the engines, provide heat and light for the house, burn materials intercepted at the screens, and furnish power for the Hough's Neck pumping station.

Average daily quantity of sewage passing screens: 94,600,000 gallons.

Maximum quantity passing screens per day: 230,000,000 gallons.

Hough's Neck Pumping Station

At this station are two 6-inch submerged Lawrence centrifugal pumps with vertical shafts actuated by two Sturtevant direct-current motors.

The labor and electric energy for this station are supplied from the Nut Island Screen-house, and as used at present it does not materially increase the amount of coal used at the latter station.

Average quantity raised each day: 263,000 gallons.

Maximum quantity raised per day: 423,000 gallons.

Squantum Pumping Station

At this station are two pumping units each consisting of a 10-inch submerged DeLaval centrifugal pump with vertical shaft actuated by a Crocker-Wheeler 60 H.P. motor. Each unit is capable of lifting 4,000,000 gallons of sewage per 24 hours against a head of 46 feet.

The electric energy for this station is purchased from the Quincy Electric Light & Power Company.

Average quantity raised each day: 178,000 gallons.

Braintree-Weymouth Pumping Station

At this station are two pumping units consisting of DeLaval centrifugal pumps actuated by 150 H.P. direct connected Winton diesel engines, together with all accessories appertaining thereto. Each unit is capable of lifting 15,000,000 gallons of sewage per 24 hours against a head of 30 feet.

Average quantity raised per day: 1,100,000 gallons.

Average Daily Volume of Sewage lifted at Each of the Ten Metropolitan Sewerage Pumping Stations during the Year, as compared with the Corresponding Volumes for the Previous Year

PUMPING STATION	AVERAGE DAILY PUMPAGE			
	Jan. 1, 1937 to Dec. 31, 1937	Jan. 1, 1936 to Dec. 31, 1936	Increase during the Year	
	Gallons	Gallons	Gallons	Per Cent.
Deer Island	84,500,000	86,400,000	1,900,000*	2.20
East Boston	82,500,000	84,400,000	1,900,000*	2.25
Charlestown	45,800,000	45,000,000	800,000	1.78
Alewife Brook	8,700,000	7,850,000	850,000	10.83
Reading	1,590,000	1,320,000	270,000	20.45
Quincy	7,480,000	8,900,000	1,420,000*	15.96
Ward Street (actual gallons pumped)	35,700,000	35,100,000	600,000	1.71
Hough's Neck	263,000	252,000	11,000	4.37
Squantum	178,000	163,000	15,000	9.20
Brantree-Weymouth	1,071,000	322,000	749,000	232.61

*Decrease.

METROPOLITAN SEWERAGE OUTFALLS

The Metropolitan Sewerage Districts now have outfalls in Boston Harbor at five points, two of which may discharge sewage from the North District and three from the South District.

During the year the sewage of the North District has been discharged wholly through the outlet located near Deer Island light. The other outfall of this system is closed by a cast-iron cover which can easily be removed.

Of the outfalls of the South District, two extend for a distance exceeding one mile from the shore of Nut Island, Quincy, and the third one, called an emergency outlet, extends about 1,500 feet from the same. It was necessary to discharge sewage through this outfall 80 hours during the year.

During the year the average flow through the North Metropolitan District outfall at Deer Island has been 84,500,000 gallons of sewage per 24 hours, with a maximum rate of 151,200,000 gallons during a stormy period in December, 1937. The amount of sewage discharged from the North Metropolitan District averaged 122 gallons per day for each person, taking the estimated population of the District contributing sewage. If the sewers in this District were restricted to the admission of sewage proper only, this per capita amount would be considerably decreased.

In the South Metropolitan District an average of 94,600,000 gallons of sewage per 24 hours has passed through the screens at the Nut Island screen-house and has been discharged from the outfalls into the outer harbor. The maximum rate of discharge per day which occurred during a stormy period in November, 1937, was 230,000,000 gallons. The discharge of sewage through these outfalls represents the amount of sewage contributed by the South Metropolitan District, which was at the rate of 179 gallons per day per person of the estimated number contributing sewage in the District.

MATERIAL INTERCEPTED AT THE SCREENS

The material removed from the sewage at the screens of the North Metropolitan Sewerage Stations, consisting of rags, paper and other floating materials, has during the year amounted to 1,678 cubic yards. This is equivalent to 1.47 cubic feet for each million gallons of sewage pumped at Deer Island.

The material removed from the sewage at the screens of the South Metropolitan Sewerage Stations amounted to 4,652 cubic yards, equal to 3.64 cubic feet per million gallons of sewage delivered at the outfall works at Nut Island.

Studies of sewage flows in the Metropolitan sewers and siphons indicate that they are free from deposit.

THE COMMONWEALTH OF MASSACHUSETTS

METROPOLITAN DISTRICT COMMISSION
SEWERAGE DIVISION

CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 106 - FEBRUARY 18, 1937

BIDDERS AND ADDRESSES	CANVASS OF BIDS - NORTH METROPOLITAN RELIEF SEWER - SECTION 106 - FEBRUARY 18, 1937																														TOTALS ALL ITEMS EXCEPT ITEMS 7, 8, 22 AND 23 BOND - ADD 1/2 PER CENT OF THE PREVIOUS TOTAL			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
P. DE CRISTOFARO 38 GLENDOWER RD. ROSLINDALE	1	2.25	2.00	200	2.50	20.00	35.00	3.00	6.00	7000.00	15,275.00	16,380,000.00	4000.00	900.00	16,575.00	24,600.00	14,400.00	1260.00	20.00	600.00	30.00	450.00	4000.00	1000.00	100.00	300.00	300.00	50.00	100.00	600.00	4,680,000.00	21,218,410.00	318,276.5	21,536,186.5*
COLEMAN BROS. CORP. 245 STATE ST. BOSTON	2	3.30	2.00	2.00	4.00	50.00	70.00	5.00	1.00	2.00	1.00	1.50	10.00	11.50	90.00	40.00	5.00	1.00	10.00	2.00	0.60	150.00	400.00	0.10	0.10	2.00	5.00	0.20	211,448.00	3171.72	214,619.72			
JOHN MACDONALD CONST. CO 215 CALIFORNIA ST. NEWTON	3	2.50	2.50	250	400	5.00	40.00	5.00	2.00	3.00	2.00	1.00	11.00	12.00	80.00	40.00	2.00	1.00	50.00	3.00	0.35	100.00	100.00	0.05	0.05	2.00	2.00	2.00	167,390.00	2510.8	169,910.85			
C. B. R. CONSTRUCTION CO. 75 BRAEEN ST. ROSLINDALE	4	2.00	1.00	1.00	3.00	2.00	20.00	1.00	4.40	8.00	0.80	0.20	9.00	9.50	70.00	30.00	0.50	0.50	0.50	0.25	40.00	50.00	0.04	0.05	0.50	0.50	425	147,315.00	2209.3	149,524.33				
V. BARLETTA CO. 10 WHIPPLE AVE. ROSLINDALE	5	2.50	0.50	0.50	2.50	10.00	25.00	2.50	1.00	1.50	2.00	0.45	11.00	12.00	75.00	25.00	200	0.60	5.00	0.50	0.25	60.00	100.00	0.06	0.06	0.50	2.00	0.80	144,732.00	2170.8	146,902.88			
EDWARD M. MATZ, INC. 25 ZAMORA ST. JAMAICA PLAIN	6	1.55	1.00	1.00	1.00	5.00	30.00	1.00	3.50	2.00	1.00	0.10	10.00	11.00	80.00	30.00	0.25	0.60	1.00	2.00	0.20	0.40	50.00	0.05	0.15	0.60	2.00	1.30	127,397.00	1910.95	129,307.95			
A. BARUFFALDI CO. 52 POWDER HOUSE BLVD. W. SOMERVILLE	7	1.10	0.50	0.50	1.00	1.00	30.00	1.10	5.00	5.00	0.70	0.20	8.00	9.00	60.00	30.00	1.00	0.50	1.00	1.00	0.40	60.00	100.00	0.04	0.05	1.00	1.00	5.00	125,960.00	1889.10	127,849.40			

DRAWN BY A.R.S.-R.D.B.
CHECKED BY A.R.S.-R.D.B.

CONTRACT AWARDED TO: A. BARUFFALDI CO.

★ This Contractor in Items 11, and 31, bid *7000 and *2000 respectively as a unit price when it was his intention that these figures were to be lump sum bids.

I certify this to be a true and accurate summary of bids
Joseph P. Dever
Chief Engineer of Sewerage Division

THE COMMUNIST SYSTEM AT THE COMMUNIST PARTY

0-30493W32

CANVAS OF 1890 - CHANGING CANVAS
THE 1890S

COMPTON, CALIFORNIA
1910-1911

Construction

NORTH METROPOLITAN RELIEF SEWER

The previous Annual Report sets forth the completion of Section 107 of the North Metropolitan Relief Sewer as of November 9, 1936. Construction of Sections 108, 111, 112, 113, 114, 115A and 115B continued and were completed respectively on the following dates:

Section 108	— April 26, 1937
Section 111	— August 13, 1937
Section 112	— October 13, 1937
Section 113	— February 12, 1937
Section 114	— July 12, 1937
Section 115A	— September 10, 1937
Section 115B	— August 21, 1937

North Metropolitan Relief Sewer, Section 106

Section 106 was started and completed during the year. This latter section is located in Medford and involves the construction of approximately 7,709 feet of 8-foot 6-inch reinforced concrete sewer. Funds appeared to be available for the construction of 3,000 feet and a contract was prepared to arrange for 3,000 linear feet of sewer construction.

Bids were opened on February 18, 1937. The contract was awarded by the Metropolitan District Commission on April 8, 1937 and accepted by the Federal Emergency Administration of Public Works on April 14, 1937. Work was started by the A. Baruffaldi Company on or about April 21, 1937 and was completed on October 19, 1937.

At the close of the year all sections were in operation and negotiations were under way for a final adjustment of quantities and amounts involved in the necessary data for final payments.

Also during the year a general contract for highway surface repairs was awarded to Warren Brothers Roads Company in the sum of \$11,595.73. This contract covered street surface repairs on several streets in the cities and towns of Medford, Winchester and Stoneham and was necessary because of sewer excavations in various streets and highways resulting from the sewer construction. Bids were opened on September 23, 1937. The contract was awarded by the Metropolitan District Commission on October 6, 1937 and accepted by the Federal Emergency Administration of Public Works on October 13, 1937. Work was started on or about October 4, 1937 and was completed on October 29, 1937.

X. Other Reports

Tables, statistics and financial statements relating to the several divisions are hereto appended.

Respectfully submitted,

E. C. HULTMAN,
Metropolitan District Commissioner.

February 28 1938.

APPENDIX No. 1

FINANCIAL STATEMENT

of the

METROPOLITAN DISTRICT COMMISSION

FOR THE YEAR ENDING NOVEMBER 30, 1937

Construction

CONDITION OF FUND AS OF DEC. 1, 1936	AMOUNT AVAIL- ABLE 1937	EXPENDED 1937	BALANCE DEC. 1, 1937
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PARKS DIVISION

Charles River Basin Improvements:

Chapter 371, Acts of 1929.	\$2,305,000.00
Less Chapter 179, Acts of 1931.	25,000.00
Interest.	129,110.00
	<hr/>
	\$2,409,110.90
Expended to Nov. 30, 1936	2,108,510.42
	<hr/>

\$300,600.48	\$19,489.23	\$281,111.25
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Metropolitan Parks Construction Fund:

Specials:

Land in Saugus and Wakefield:

Chapter 384, Acts of 1934.	\$40,000.00
Expended to Nov. 30, 1936	39,015.75
	<hr/>

\$984.25	\$984.25	-
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Additional Facilities—Ponkapoag Golf Course:

Chapter 234, Acts of 1937.	\$20,000.00
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\$2,900.24	\$17,099.76
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Oak Island Sanitary:

Chapter 234, Acts of 1937	\$12,000.00
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\$18.00	\$11,982.00
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Radio Room:

Chapter 234, Acts of 1937.	\$5,000.00
----------------------------	------------

-	\$5,000.00
---	------------

Bath House, Watertown:

Chapter 331, Acts of 1936	\$40,000.00
---------------------------	-------------

\$39,961.99	\$27.84	\$39,934.15
-------------	---------	-------------

Expended to Nov. 30, 1936	38.01
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Beach	\$23,000.00
-------	-------------

\$23,000.00	\$23,127.53	\$127.53
-------------	-------------	----------

Expended to Nov. 30, 1936	-
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Taking of Land and Incidental Expenses	\$2,000.00
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\$2,000.00	-	\$2,000.00
------------	---	------------

Expended to Nov. 30, 1936	-
---------------------------	---

Total, Bath House, Watertown:

Chapter 331, Acts of 1936.	\$32,500.00
----------------------------	-------------

\$64,961.99	\$23,155.37	\$41,806.62
-------------	-------------	-------------

Chapter 432, Acts of 1936.	32,500.00
----------------------------	-----------

Expended to Nov. 30, 1936	38.01
---------------------------	-------

Metropolitan Parks Construction Fund,

Boulevards:

Specials:

Improvement of Land, Old Colony Parkway:

Chapter 497, Acts of 1935	\$30,000.00
---------------------------	-------------

\$29,713.84	\$29,209.00	\$504.84
-------------	-------------	----------

Incidentals	286.16
-------------	--------

Expended to Nov. 30, 1936	<hr/>
---------------------------	-------

Bath House	\$70,000.00
------------	-------------

\$25,875.74	\$21,057.61	\$4,818.13
-------------	-------------	------------

Expended to Nov. 30, 1936	44,124.26
---------------------------	-----------

Total, Improvements of Land, Old Colony

Parkway:	\$100,000.00
----------	--------------

\$55,589.58	\$50,266.61	\$5,322.97
-------------	-------------	------------

Chapter 497, Acts of 1935.	44,410.42
----------------------------	-----------

Expended to Nov. 30, 1936	<hr/>
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Reconstruction Mystic River Bridge

Chapter 432, Acts of 1936.	\$46,875.00
----------------------------	-------------

\$47,615.70	\$47,587.57	\$28.13
-------------	-------------	---------

Chapter 377, Acts of 1936.	18,750.00
----------------------------	-----------

Chapter 377, Acts of 1936.	9,375.00
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	\$75,000.00
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Expended to Nov. 30, 1936	27,384.30
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	<hr/>
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Reconstruction, Mystic River Bridge: Harvard Avenue,

Medford:	\$52,500.00
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Chapter 445, Acts of 1937.	\$36,494.39
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\$16,005.61	
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Construction: (Continued)

CONDITION OF FUND AS OF DEC. 1, 1936	AMOUNT AVAILABLE 1937	EXPENDED 1937	BALANCE DEC. 1, 1937
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SEWERAGE DIVISION

Metropolitan Sewerage Construction Fund,
North System:

Specials:

New Mystic Valley Main Sewer:

Chapter 184, Acts of 1927 . . .	\$450,000.00
Chapter 381, Acts of 1931 . . .	20,482.25

Expended to Nov. 30, 1936 . . .	\$470,482.25
	461,287.86

	\$9,194.39	-	\$9,194.39
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Massachusetts State Project D-101 P.W.A.

Docket No. Mass. 1098R:

\$3,000,000.00

Expended to Nov. 30, 1936 . . .	1,374,528.74
---------------------------------	--------------

	\$1,625,471.26	\$1,224,086.59	\$401,384.67
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Plans for Sewer System:

Chapter 433, Acts of 1937	\$270,000.00	\$9,614.82	\$260,385.18
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Metropolitan Sewerage Construction Fund,
South System:

General	\$10,005,151.75
Receipts	24,599.61

	\$10,029,751.36
--	-----------------

Expended to Nov. 30, 1936 . . .	10,026,569.58
---------------------------------	---------------

	\$3,181.78	-	\$3,181.78*
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Specials:

New Neponset Valley Sewer:

Chapter 384, Acts of 1928 . . .	\$2,365,000.00
Chapter 384, Acts of 1934 . . .	10,000.00

	\$2,375,000.00
--	----------------

Expended to Nov. 30, 1936 . . .	2,374,213.83
---------------------------------	--------------

	\$786.17	\$110.00	\$676.17
--	----------	----------	----------

Gravity Drainage, City of Quincy:

Chapter 240, Acts of 1928 . . .	\$150,000.00
Expended to Nov. 30, 1936 . . .	143,980.48

	\$6,019.52	-	\$6,019.52
--	------------	---	------------

Less amount transferred to Hyde Park Branch Sewer			5,000.00
--	--	--	----------

	\$1,019.52
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Sewers in Quincy, Weymouth and Braintree:

Chapter 398, Acts of 1930 . . .	\$600,000.00
Expended to Nov. 30, 1936 . . .	571,198.68

	\$28,801.32	\$414.81	\$28,386.51
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Boston-Newton Main Sewer:

Chapter 205, Acts of 1932 . . .	\$100,000.00
Expended to Nov. 30, 1936 . . .	95,704.65

	\$4,295.35	\$100.00	\$4,195.35
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Hyde Park Branch Sewer:

Chapter 384, Acts of 1934 . . .	\$20,000.00
Transferred from Gravity Drainage, City of Quincy	5,000.00

Expended to Nov. 30, 1936 . . .	\$25,000.00
	24,652.54

	\$347.46	-	\$347.46*
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WATER DIVISION

Metropolitan Water Construction Fund:

General	\$43,070,000.00
Receipts	334,155.46

	\$43,404,155.46
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Expended to Nov. 30, 1936 . . .	43,361,666.17
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	\$42,489.29
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Receipts, year ending Nov. 30, 1937 . . .	172.50
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	\$42,661.79
--	-------------

	\$4,009.93	\$38,651.86
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Specials:

Property for Protection of Water Supply:

Chapter 304, Acts of 1936 . . .	\$10,000.00
Expended to Nov. 30, 1936 . . .	8,037.43

	\$1,962.57
--	------------

Chapter 234, Acts of 1937 . . .	15,000.00
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	\$16,962.57
--	-------------

	\$302.63	\$16,659.94
--	----------	-------------

Construction—(Continued)

Miscellaneous PARKS DIVISION

Metropolitan Parks Expense Fund:						
Special:						
Bath House, Mystic Lakes:						
Chapter 426, Acts of 1930.		\$50,000.00				
Transferred to Metropolitan Parks Expense Fund		35,000.00				
		<u>\$15,000.00</u>				
Expended to Nov. 30, 1936		11,877.08		\$3,122.92	-	\$3,122.92*
Metropolitan Parks Trust Fund:						
Total Receipts to Dec. 1, 1936.		\$42,151.06				
Total expenditures to Nov. 30, 1936		38,140.11				
		<u>\$4,010.95</u>				
Receipts year ending Nov. 30, 1937.		234.80				
		<u>\$4,245.75</u>				
Edwin U. Curtis Memorial Trust Fund:						
Total receipts to Dec. 1, 1936		\$1,978.37				
Total expenditures to Nov. 30, 1936		237.59				
		<u>\$1,740.78</u>				
Receipts year ending Nov. 30, 1937.		63.00				
		<u>\$1,803.78</u>				
Metropolitan Parks Fund, Special:						
Receipts year ending Nov. 30, 1937.			\$104,018.81		\$55.00	\$103,963.81
Blue Hills Golf Course—Income:						
Total receipts to Dec. 1, 1936		\$99,638.07				
Total expenditures to Nov. 30, 1936		320.00				
		<u>\$99,318.07</u>				
Receipts year ending Nov. 30, 1937.		25,988.41				
		<u>\$125,306.48</u>				
Drainage in Everett, Malden and Revere:						
Total deposited by above cities.		\$70,000.00				
Interest (1926-1933)		9,867.72				
		<u>\$79,867.72</u>				
Expended to Nov. 30, 1936		61,497.50		\$18,370.22	\$18,370.22	

* Reverted.

Miscellaneous (Continued)

	CONDITION OF FUND AS OF DEC. 1, 1936	AMOUNT AVAILABLE 1937	EXPENDED 1937	BALANCE DEC. 1, 1937
Parks Division (Continued)				
Emergency Public Works Commission—Construction Massachusetts State Project D-1				
P.W.A. Docket No. 4478:				
Metropolitan District Commission, Wellington Bridge:				
Authorization	\$930,251.44			
Expended to Nov. 30, 1936	892,537.46			
	<hr/>	<hr/>	<hr/>	<hr/>
		\$37,713.98	\$25,679.03	\$12,034.95

Maintenance PARKS DIVISION

Metropolitan Parks Maintenance Fund:

General:

Chapter 234, Acts of 1937	.\$1,148,701.77
Chapter 434, Acts of 1937	7,280.00
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	15,290.90

\$1,171,272.67	\$1,089,863.59	\$81,409.08
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Specials:

Band Concerts:

Chapter 234, Acts of 1937	\$20,000.00	\$19,773.78	\$226.22*
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Expenses for Procuring W.P.A. Funds:

Chapter 304, Acts of 1936	\$20,000.00
Expended to Nov. 30, 1936	13,562.20
	<hr/>
Chapter 234, Acts of 1937	12,000.00
Chapter 434, Acts of 1937	14,000.00

\$32,437.80	\$8,277.71	\$24,160.09
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Repairs, Lynn Sea Wall:

Chapter 304, Acts of 1936	\$10,000.00
Expended to Nov. 30, 1936	3,968.43
	<hr/>
Chapter 234, Acts of 1937	11,000.00

\$17,031.57	\$16,837.02	\$194.55
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Investigations, Roadway, Waterway Improvements:

Chapter 432, Acts of 1936	\$750.00
Expended to Nov. 30, 1936	183.07
	<hr/>
	\$566.93

\$566.93*	
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Flood Damage:

Chapter 432, Acts of 1936	\$30,000.00
Expended to Nov. 30, 1936	17,410.37
	<hr/>
	\$12,589.63

\$12,103.64	\$485.99
-------------	----------

Certain Lighting, Cambridge:

Chapter 432, Acts of 1936	\$6,144.00
Expended to Nov. 30, 1936	-
	<hr/>

\$6,144.00	\$6,144.00
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Bulkhead, Lynn Playground:

Chapter 437, Acts of 1936	\$10,000.00
Expended to Nov. 30, 1936	4,978.55
	<hr/>

\$5,021.45	\$5,003.33	\$18.12
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Improving Wollaston Beach:

Chapter 234, Acts of 1937	\$6,000.00	\$4,300.66	\$1,699.34
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Sundry Investigations:

Chapter 434, Acts of 1937	\$4,500.00	\$2,887.28	\$1,612.72
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Storm Damages, Revere, Winthrop, and Quincy Shores:

Chapter 434, Acts of 1937	\$2,000.00	-	\$2,000.00
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Sewer Extension, Nahant Beach:

Chapter 434, Acts of 1937	\$1,200.00	\$970.00	\$230.00
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Repairs—Shelters at Revere Beach:

Chapter 434, Acts of 1937	\$10,000.00	\$32.60	\$9,967.40
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Repairs—Sea Wall, Winthrop:

Chapter 434, Acts of 1937	\$4,000.00	\$2,068.42	\$1,931.58
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Renovating Magazine Beach Bath House:

Chapter 434, Acts of 1937	\$15,000.00	-	\$15,000.00
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Dredging Savin Hill Basin:

Chapter 434, Acts of 1937	\$3,000.00	\$3,000.00	-
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Chapter 434, Acts of 1937.

Metropolitan Parks Maintenance Fund, Boulevards:

General:

Chapter 234, Acts of 1937	\$698,820.00
Chapter 434, Acts of 1937	14,395.00
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	7,521.69

\$720,736.69	\$656,880.42	\$63,856.27
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Maintenance (Continued)

Parks Divisions—Continued	CONDITION OF FUNDS AS OF DEC. 1, 1936	AMOUNT AVAILABLE 1937	EXPENDED 1937	BALANCE DEC. 1, 1937
Metropolitan Park Maintenance Fund, Boulevards (Continued)				
Specials:				
Circumferential Highway:				
Chapter 398, Acts of 1926.	\$115,000.00			
Chapter 386, Acts of 1929.	159,000.00			
Chapter 115, Acts of 1930.	371,000.00			
Chapter 460, Acts of 1931.	28,947.37			
Chapter 170, Acts of 1932.	21,052.63			
		\$695,000.00		
Expended to Nov. 30, 1936	685,790.92		\$9,209.08	— \$9,209.08*
Boulevard, Fellsway to Mystic Avenue, Medford:				
Chapter 460, Acts of 1931.	\$189,473.68			
Chapter 170, Acts of 1932.	210,526.32			
Chapter 384, Acts of 1934.	100,000.00			
Chapter 497, Acts of 1935.	20,000.00			
		\$520,000.00		
Expended to Nov. 30, 1936	518,450.75		\$1,549.25	— \$1,549.25
Brookline-Newton Boulevard:				
Chapter 460, Acts of 1931.	\$231,578.95			
Chapter 170, Acts of 1932.	168,421.05			
		\$400,000.00		
Expended to Nov. 30, 1936	300,832.53		\$99,167.47	— \$99,167.47
Grading and Landscaping:				
Chapter 304, Acts of 1936.	\$25,000.00			
Expended to Nov. 30, 1936	16,550.88		\$8,449.12	\$7,284.95 \$1,164.17
Expenses for Procuring W.P.A. Funds:				
Chapter 304, Acts of 1936.	\$13,000.00			
Expended to Nov. 30, 1936	6,361.83			
		\$6,638.17		
Chapter 234, Acts of 1937.	8,000.00			
Chapter 434, Acts of 1937.	16,000.00			
		\$30,638.17		\$18,216.97 \$12,421.20
Flood Damage:				
Chapter 432, Acts of 1936.	\$20,000.00			
Expended to Nov. 30, 1936	15,454.47		\$4,545.53	\$3,109.46 \$1,436.07
Resurfacing Boulevards and Parkways:				
Chapter 234, Acts of 1937	\$275,000.00			
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	31,734.35			
		\$306,734.35		\$285,886.21 \$20,848.14
Additional Street Lighting:				
Chapter 234, Acts of 1937.	\$32,000.00		\$6,581.88	\$25,418.12
Tablets for Bridges:				
Chapter 434, Acts of 1937.	\$1,500.00		\$23.65	\$1,476.35
Charles River Basin Maintenance Fund:				
Chapter 234, Acts of 1937.	\$264,870.00			
Chapter 434, Acts of 1937.	1,215.00			
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books.	17,626.51			
		\$283,711.51		\$221,513.25 \$62,198.26
Metropolitan Parks Maintenance Fund, Nantasket:				
Chapter 234, Acts of 1937.	\$104,700.00			
Chapter 434, Acts of 1937.	610.00			
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	363.68			
		\$105,673.68		\$94,410.23 \$11,263.45
Metropolitan Parks Maintenance Fund, Wellington Bridge:				
Chapter 234, Acts of 1937.	\$13,600.00			
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	58.46			
		\$13,658.46		\$10,804.27 \$2,854.19
Maintenance of Bunker Hill Monument:				
Chapter 234, Acts of 1937.	\$12,300.00			
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	795.00			
		\$13,095.00		\$12,409.05 \$685.95

Maintenance (Continued)

CONDITION OF FUND AS OF DEC. 1, 1936	AMOUNT AVAILABLE 1937	EXPENDED 1937	BALANCE DEC. 1, 1937
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SEWERAGE DIVISION

Metropolitan Sewerage Maintenance Fund, North System:

General:

Chapter 234, Acts of 1937	\$417,805.00
Chapter 434, Acts of 1937	540.00
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	20,086.62
	<hr/>
	\$438,431.62

Specials:

Boilers, East Boston Pumping Station:	
Chapter 234, Acts of 1937	\$15,000.00
Deer Island Wharf:	
Chapter 234, Acts of 1937	\$2,000.00
Trestle, Deer Island:	
Chapter 234, Acts of 1937	\$20,000.00
	<hr/>
	\$64.12
	\$38.90
	\$15,692.38
	<hr/>
	\$14,935.88
	\$1,961.10
	\$4,307.62

Metropolitan Sewerage Maintenance Fund, South System:

Chapter 234, Acts of 1937	\$300,437.00
Chapter 434, Acts of 1937	945.00
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	9,876.00
	<hr/>
	\$311,258.00
	\$276,242.88
	<hr/>
	\$35,015.12

WATER DIVISION

Metropolitan Water Maintenance Fund:

General:

Chapter 234, Acts of 1937	\$1,006,390.00
Balance brought forward from 1936 appropriation to cover 1936 expenditures on 1937 books	19,952.92
	<hr/>
	\$1,026,342.92
	\$986,088.40
	<hr/>
	\$40,254.52

Specials:

Additional Pumping Equipment:	
Chapter 245, Acts of 1931	\$50,000.00
Chapter 170, Acts of 1932.	50,000.00
Chapter 174, Acts of 1933.	50,000.00
	<hr/>
\$150,000.00	
Expended to Nov. 30, 1936	149,975.40
	<hr/>
	\$24.60
	<hr/>
	\$24.60*

Repairs to Water Main:

Chapter 434, Acts of 1937	\$10,000.00
	<hr/>
	\$5,920.45
	<hr/>
	\$4,079.55

Receipts — Year Ended November 30, 1937

PARKS DIVISION

Credited to:

Metropolitan Parks Fund, Special	\$103,963.81
Metropolitan Parks Maintenance Fund, General	39,814.35a
Metropolitan Parks Maintenance Fund, Boulevards	746.19b
General Revenue.	3,749.73
	<hr/>
	\$148,274.08

*Reverted.

aIncludes prior year Account \$84.22.

bIncludes prior year Account \$2.22.

SEWERAGE DIVISION

Credited to:

Metropolitan Sewerage Sinking Fund, North System	\$495.00
Metropolitan Sewerage Maintenance Fund, North System	6,973.26
Metropolitan Sewerage Maintenance Fund, South System	6,988.06
Metropolitan Sewerage Interest Fund, North System	12.00
	<hr/>
	\$14,468.32

WATER DIVISION

Credited to:

Metropolitan Water Loan Interest Fund	\$38.00
Metropolitan Water Construction Fund.	135.70
Metropolitan Water Sinking Fund	133,934.49
Metropolitan Water Maintenance Fund.	17,907.64
	<hr/>
	\$152,015.83

Financial Statement Verified
February 17, 1938 (J. D. M.)Approved, GEO. E. MURPHY,
Comptroller

APPENDIX NO. 2

TABLE 1

The following is a record of the traffic through locks and drawbridges during the year.
Charles River Dam Lock and Drawbridge

Number of openings of highway drawbridge	1,903
Number of openings of lock	4,353
Number of vessels	2,029
Number of small boats	7,128
Number of rafts	2
Coal (tons)	15,443
Sand (tons)	175,595
Gravel (tons)	74,092
Oil (bbls.)	601,050
Oil (gals.)	14,557,584
Granite (tons)	236
Mud (tons)	3,225
Lumber (ft. B. M.)	1,451,000

Cradock Bridge Lock

Number of openings	273
Number of boats through lock	303
Number of boats over rolls	36

Dorchester Bay Drawbridge

Number of openings	982
Number of vessels	1,081

General Edwards Drawbridge

Number of openings	260
Number of vessels	417

Malden River Drawbridge

Number of openings	207
Number of vessels	395

Mystic River Drawbridge

Number of openings (test)	1
Number of vessels	0

Neponset River Drawbridge

Number of openings	253
Number of vessels	379

Wellington Drawbridge

Number of openings	4
Number of vessels	5

TABLE 4

Lengths of Roads and Bridle Paths in Reservations not Open to Motor Vehicles

	Miles
Blue Hills Reservation	74.08
Middlesex Fells Reservation	25.00
Stony Brook Reservation	24.60
Beaver Brook Reservation . . . . .	.22
Charles River Reservation	2.39
Hammond Pond Parkway	2.00
	<hr/> 128.29

TABLE 2.—Metropolitan Park System—Areas of Reservations and Parkways—December 31, 1937.

		(RESERVATIONS ACRES)																		(PARKWAYS ACRES)																		Grand Total Reser- vations and Park- ways (Acres)	
		Beaver Brook	Blue Hills	Breakheart	Bunker Hill	Charles River	Hemlock Gorge	King's Beach and Lynn Shore	Middlesex Fells	Mystic River	Nantasket Beach	Neponset River	Revere Beach	Stony Brook	Winthrop Shore	Total Acres	Alewife Brook	Blue Hills	Veterans of Foreign Wars	Dedham	Fresh Pond	Furnace Brook	Hammond Pond	Lynn Falls	Lynnway	Middlesex Fells	Mystic Valley	Nahant Beach	Neponset River	Old Colony	Quannapowitt	Revere Beach	West Roxbury	Winthrop	Woburn	Total Acres			
1	Cities.																																						
1	Boston .																																						1,046.52
2	Cambridge .																																					322.63	
3	Chelsea .																																					21.16	
4	Everett .																																					31.37	
5	Lynn .																																					4	
6	Malden .																																					5	
7	Medford .																																					6	
8	Melrose .																																					83.11	
9	Newton .																																					23.58	
10	Quincy .																																					1,337.98	
11	Revere .																																					7	
12	Somerville .																																					1.25	
13	Waltham .	42.77																																				20.84	
14	Woburn .																																					5	
15	Towns.																																					14	
16	Arlington .																																					14	
17	Belmont .	15.55																																				15	
18	Brookline .																																					16	
19	Canton .																																					17	
20	Dedham .																																					18	
21	Dover .																																					19	
22	Hingham .																																					20	
23	Hull .																																					21	
24	Milton .																																					22	
25	Nahant .																																					23	
26	Needham .																																					24	
27	(Randolph) .																																					25	
28	Saugus .																																					26	
29	Stoneham .																																					27	
30	Swampscott .																																					28	
31	Wakefield .																																					29	
32	Watertown .																																					30	
33	Wellesley .																																					31	
34	Weston .																																					32	
35	Westwood .																																					33	
36	Weymouth .																																					34	
37	Winchester .																																					35	
	Winthrop .																																					36	
		58.32	5,770.16	619.53	6.05	960.75	23.06	22.69	2,170.79	56.06	25.59	920.03	40.75	64.31	463.72	16.83	11,218.64	144.74	83.58	52.50	37.14	12.40	101.12	192.50	40.35	8.65	80.42	343.07	66.54	80.24	53.39	15.54	127.85	89.25	8.74	23.23	1,561.25	12,779.89	

*Includes East Milton St. from Wolcott Square to Paul's Bridge.

B
M
St
B
C
H

TABLE 5
Electric Street Lights on Parkways and Reservations

	Lights
Alewife Brook Parkway (27-600 c. p., 1-1500 c. p.)	28
Blue Hills Parkway (600 c.p.)	59
Blue Hills Reservation, Hillside Street (80 c.p.)	14
Charles River Dam, Reservation (1500 c.p.)	9
Charles River Dam, Roadway (1000 c.p.)	20
Charles River Reservation, Boston Embankment (250 c.p.)	80
Charles River Reservation, Embankment Road (2-100 c.p., 17-600 c.p.)	19
Charles River Reservation, North Beacon Street (4-1500 c.p., 9-1000 c.p.)	13
Charles River Reservation, Soldiers' Field Road (63-1000 c.p., 54-1500 c.p.)	117
Dorchester Bay Bridge (1500 c.p.)	8
Fresh Pond Parkway (15-250 c.p.)	15
Furnace Brook Parkway (600 c.p.)	58
General Edwards Bridge (800 c.p.)	24
Harvard Bridge (600 c.p.)	24
High Street Bridge (600 c.p.)	6
Larz Anderson Bridge (100 c.p.)	24
Lynn Fells Parkway (600 c.p.)	28
Lynn Shore Reservation (4-1000 c.p., 44-600 c.p.)	48
Lynnway (1-1000 c.p., 10-600 c.p.)	11
Memorial Drive (32-600 c.p., 213-250 c.p.)	245
Middlesex Fells Parkway (7-1500 c.p., 243-600 c.p.)	250
Middlesex Fells Reservation (2-80 c.p., 35-250 c.p., 21-600 c.p.)	58
Mystic Valley Parkway (1-250 c.p., 89-600 c.p.)	90
Nahant Beach Parkway (600 c.p.)	16
Nantasket Beach Reservation (1000 c.p.)	48
Neponset Bridge (600 c.p.)	16
Neponset Valley Parkway (600 c.p.)	21
Old Colony Parkway (47-1500 c.p., 2-1000 c.p.)	49
Quincy Shore Boulevard (600 c.p.)	57
Revere Beach Parkway (600 c.p.)	191
Revere Beach Reservation (2-60 c.p., 1-250 c.p., 107-1500 c.p.)	110
River Street Bridge (250 c.p.)	8
Weeks Bridge (100 c.p.)	24
Wellington Bridge (800 c.p.)	22
Western Avenue Bridge (250 c.p.)	8
West Roxbury Parkway (28-600 c.p., 2-1000 c.p.)	30
Winthrop Parkway (14-250 c.p., 7-600 c.p.)	21
Winthrop Shore Reservation (600 c.p.)	23
Woburn Parkway (600 c.p.)	4
	11
	1,896

¹Seventeen all year until 1 A.M.

²Three 600 c.p. June 1 to December 1

³Four 600 c.p. all year until 1 A.M.

⁴Two 80 c.p., thirty-five 250 c.p., and five 600 c.p. all year until 1 A.M.

⁵Ten 600 c.p. all night, except November 1 to March 31 until 1 A.M. Thirty-three 600 c.p. all year until 1 A.M.

⁶Four June 1 to December 1.

⁷Twelve June 1 to October 31. Fourteen in summer only.

⁸Twenty-nine all night, April 1 to October 31. Two until 1 A.M. all year.

⁹Twenty-seven 1,500 c.p. all night, May 1 to October 31. Thirty-one 1,500 c.p. to midnight, June 1 to September 30. One 60 c.p. all night, May 1 to September 30.

¹⁰Twenty-eight 600 c.p. all night, except November 1 to March 31, until 1 A.M.

¹¹Until 1 A.M.

TABLE 6
Miles of Seashore

	Miles
Lynn Shore	1.50
Nahant Beach	2.93
Nantasket Beach	1.02
Quincy Shore	2.19
Revere Beach	2.74
Winthrop Shore	1.71
Total	12.09

Lengths of Sea Walls

	Miles
Lynn Shore	1.30
Nahant Beach Parkway, north of Wilson Road . . . . .	.35
Nantasket Beach Reservation . . . . .	.94
Quincy Shore Reservation, shore protection south of Webster Street	1.08
Quincy Shore Reservation, southerly end . . . . .	.15
Revere Beach at Eliot Circle . . . . .	.15
Revere Beach at Northern Circle . . . . .	.08
Revere Beach, shore protection, south of Northern Circle . . . . .	.28
Revere Beach, shore protection, bathhouse shelter to Revere Street shelter . . . . .	.29
Winthrop Parkway, Revere and Winthrop, Broad Sound Avenue to Sewall Avenue . . . . .	.52
Winthrop Shore, bridge to Great Head	1.04
Winthrop Shore, bridge to Grover's Cliff . . . . .	.23
Total	6.41

Miles of River Bank

	Miles
Alewife Brook	4.50
Charles River	33.97
Mystic River	8.41
Neponset River	15.86
Total	62.74

TABLE 7
Bridges

Drawbridges	7
Footbridges	14
Reinforced concrete bridges	25*
Steel bridges	18
Stone masonry bridge	1
Wooden bridges	5
Total	70

Culverts

Reinforced concrete and other masonry culverts	60
--	----

*Bridge over Mystic River at River Street and Harvard Avenue.

TABLE 8

Beaver Brook Reservation, small wooden dams	2
Blue Hills Parkway, small wooden dam at Canton Avenue Circle	1
Blue Hills Reservation, small wooden dams at St. Moritz	2
Blue Hills Reservation, small concrete dam at Ponkapoag Pond	1
Breakheart Reservation, small concrete dams	2
Charles River Reservation, wooden dam at Watertown, 220 feet in length	1
Charles River Reservation, Charles River Basin, tidal dam, 1,200 feet in length	1
Charles River Reservation, small stone dam in branch below Washington Street, Newton Lower Falls	1
Charles River Reservation, reinforced concrete dam at Washington Street, Newton Lower Falls, 140 feet in length	1
Charles River Reservation, stone masonry dam with stop planks, at Moody Street Bridge, about 170 feet in length	1
Furnace Brook Parkway, reinforced concrete dam upstream from Black's Creek Bridge	1
Hemlock Gorge Reservation, small stone masonry dam with stop planks, in gorge	1
Hemlock Gorge Reservation, small reinforced concrete dam on east branch of River, Newton Upper Falls	1
Hemlock Gorge Reservation, reinforced concrete dam in Charles River at Boylston Street, Newton Upper Falls, 90 feet in length	1
Hemlock Gorge Reservation, small concrete dam at Reservoir Street	1
Mystic River Reservation, reinforced concrete tidal dam at Cradock Bridge, 100 feet in length, weirs 400 feet in length	1
Total	19

Lock Gates, Sluice Gates and Tide Gates

Charles River Reservation, Charles River Basin Tidal Dam, 6 lock gates, 13 sluice gates, 43 tide gates.

Mystic River Reservation, Cradock Bridge Tidal Dam, 2 lock gates, 4 sluice gates, 8 tide gates.

Quincy Shore Reservation, 8 tide gates.

Old Colony Parkway, Tenean Street, 1 tide gate.

TABLE 9

CONTRACTS MADE AND PENDING DURING

Contract Number	WORK	Number of Bids	Lowest
279	Reconstruction of Mystic Valley Parkway at Medford Street, Arlington, and at High Street, Medford	10	\$9,496.00
280	Grading of southerly slope to southerly roadway of Broadway Overpass, Revere Beach Parkway, Revere	5	1,810.00
281	Furnishing, planting and care of trees, shrubs and vines at the Broadway Overpass, Revere Beach Parkway, Revere	5	2,254.50
282	Furnishing and installing water pipe, electrical power cables and incidental equipment for services to Malibu Beach Bathhouse in the Dorchester District of Boston	6	5,566.00
283	Reconstructing Mystic Valley Parkway, Arlington, from Mystic Street 1455 feet northerly	14	13,999.00
284	Constructing 6 feet 0 inches steel picket fence along the sides of Old Colony Parkway and 3 feet 0 inches steel fence around the Malibu Beach Bathhouse at Malibu Beach in the Dorchester District of Boston	5	7,790.00
285	Reconstruction of the northerly roadway, Memorial Drive, Cambridge, from Massachusetts Avenue 2040 feet westerly	8	14,505.90
286	Reconstruction of the easterly roadway of Fellsway East from Highland Avenue to East Border Road, Middlesex Fells Parkway, and East Border Road to beyond Seery Street, Middlesex Fells Reservation in Malden	6	20,777.00
287	Surfacing of Chickatawbut Road between Randolph Avenue and Granite Street, Quincy, Milton, and Braintree	8	16,765.00
288	Reconstruction of Furnace Brook Parkway from Adams Street to Willard Street, Quincy	10	25,488.00
289	Constructing cement concrete walks and loam areas at the Malibu Beach Bathhouse in the Dorchester District of Boston	11	15,000.00*
290	Cleaning and painting buildings and fences at Police Headquarters, Middlesex Fells Reservation, Pond Street, Stoneham	6	1,869.00†
291	Reconstruction of Soldiers Field Road from North Harvard Street northwesterly 2600 feet, Charles River Reservation, in the Brighton District of Boston	7	22,450.00
292	Reconstruction of Quincy Shore Reservation from Feno Street to Blacks Creek Bridge in Quincy	6	18,800.00
293	Resurfacing of Hammond Pond Parkway from the circle at Newton Street and Hammond Street to Heath Street in Brookline	7	10,086.00
294	Reconstructing the approaches of Dorchester Bay Bridge, Old Colony Parkway, in the Dorchester District of Boston	4	26,294.00
295	Repairs to sea wall, steps and sidewalk, Washington Street to Humphrey Street, Lynn Shore Reservation, Lynn and Swampscott	18	8,177.00
296	Paving the westerly shore and ends of the breakwater at Boat Haven in the Charles River Basin opposite Pinckney Street, Boston	5	4,400.00
297	Resurfacing the westerly roadway of Fellsway East from Highland Avenue to East Border Road, Middlesex Fells Parkway, and drain work on East Border Road, Middlesex Fells Reservation, in Malden	6	1,691.50
298	Furnishing and placing stone ballast shore protection from the end of granite faced sea wall about 400 feet northerly, Winthrop Shore Reservation, Winthrop	9	1,680.00
299	Reconstructing southerly corner of Waterfield Road at Mystic Valley Parkway, Winchester	8	1,141.50
300	Constructing bridge and approaches over the Mystic River at River Street, Arlington, and Harvard Avenue, Medford	11	69,332.50
301	Furnishing and installing lighting standards and concrete bases on Alewife Brook Parkway, Cambridge, and Mystic Valley Parkway, Medford and Winchester	4	12,600.00†
302	Reconstruction of sea wall and steps, Milton Road to Carle Road Quincy Shore Reservation, Quincy	16	4,725.00
303	Reconstruction of Revere Beach Parkway, northerly roadway, from Second Street to Everett Avenue, Everett	9	28,200.00
304	Reconstruction of Mystic Valley Parkway from Main Street to Mystic Avenue, Medford	8	29,500.00
305	Repairing southerly half of Winthrop Avenue Bridge over the Boston and Maine Railroad, Revere Beach Parkway, Revere (Maintenance Work)	3	11,430.00
306	Redecking of upstream leaf and improvements to locking devices at the Charles River Dam in Boston (Maintenance Work)	2	10,876.00
307	Building, maintaining, and removing temporary bridge and approaches across Mystic River near Harvard Street, Medford, and River Street, Arlington	6	1,200.00
308	Furnishing and erecting bronze tablets on three bridges over the Mystic River in Somerville, Medford, and Arlington	1	774.00
309	Painting the bridge over the Boston and Maine Railroad, Fitchburg Division, Alewife Brook Parkway, Cambridge (Maintenance Work)	3	2,310.00
310	Renewal of plumbing and plumbing fixtures at underground public comfort station, Charles River Embankment, Boston	4	2,495.00
311	Construction of sanitary building on Revere Beach Reservation at Oak Island, Revere	9	10,683.00
312	Renewal of boilers at Nantasket Beach Reservation, Hull (Maintenance Work)	8	10,191.00
313	Repairs to lock gates at Cradock Dam, Medford (Maintenance Work)	9	3,526.20

TABLE 9

THE YEAR 1937 — PARKS DIVISION

CONTRACTOR	Date of Contract	Date of Completion of Contract	Value of Work Done Dec. 31, 1937
Coleman Bros. Corp.	Apr. 15, 1937	June 12, 1937	\$11,333.90
M. McDonough Corp.	May 6, 1937	May 12, 1937	1,724.63
Littlefield-Wyman Nurseries	Apr. 29, 1937	May 27, 1937	2,220.50
G. L. & C. Company	May 6, 1937	Sept. 10, 1937	6,022.00
C. & R. Construction	May 13, 1937	July 21, 1937	13,999.00
P. J. Dinn & Company	May 20, 1937	Aug. 26, 1937	7,790.00
National Contractors Company	June 3, 1937	July 19, 1937	14,680.90
John P. Condon Corp.	June 3, 1937	July 10, 1937	20,777.00
M. F. Gaddis, Inc.	June 3, 1937	Sept. 15, 1937	16,965.00
M. F. Gaddis, Inc.	June 10, 1937	Sept. 15, 1937	25,488.00
C. & R. Construction Company	June 16, 1937	Sept. 2, 1937	15,000.00
Maurice M. Devine, Inc.	June 16, 1937	July 28, 1937	1,869.00
John P. Condon Corp.	June 10, 1937	Aug. 4, 1937	22,450.00
M. F. Gaddis, Inc.	June 16, 1937	Aug. 7, 1937	18,800.00
John P. Condon Corporation	June 24, 1937	July 23, 1937	10,086.00
Samuel J. Tomasello Corporation	July 8, 1937	Sept. 1, 1937	26,294.00
Vulcan Construction Company	July 22, 1937	Sept. 30, 1937	10,798.70
George M. Bryne	Aug. 5, 1937	Sept. 23, 1937	4,400.00
M. McDonough Corp.	Aug. 12, 1937	Aug. 18, 1937	1,691.50
M. McDonough Corp.	Aug. 12, 1937	Aug. 20, 1937	2,039.02
M. McDonough Corp.	Aug. 12, 1937	Aug. 25, 1937	1,141.50
M. McDonough Corp.	Aug. 26, 1937	—	61,330.55
New England Sales & Manufacturing Co.	Sept. 9, 1937	—	10,110.00
N. Cibotti Company	Sept. 9, 1937	Nov. 1, 1937	4,848.25
John P. Condon Corporation	Sept. 9, 1937	Oct. 16, 1937	28,614.60
F. & M. Construction Corporation	Sept. 23, 1937	—	25,000.00
Vulcan Construction Company	Sept. 16, 1937	Dec. 22, 1937	12,457.00
The Boston Bridge Works, Inc.	Sept. 16, 1937	—	6,000.00
M. McDonough Corp.	Sept. 16, 1937	—	1,000.00
T. F. McGann & Sons Company	Oct. 7, 1937	Nov. 16, 1937	774.00
C. W. Dolloff & Company	Oct. 21, 1937	Dec. 2, 1937	2,310.00
William N. McKenna Company	Oct. 14, 1937	Dec. 7, 1937	2,495.00
Federal Contracting Co., Inc.	Nov. 24, 1937	—	1,500.00
Acme Heating and Ventilating Co.	Nov. 10, 1937	—	6,950.00
Vulcan Construction Co.	Nov. 4, 1937	—	4,842.80

TABLE 9

CONTRACTS MADE AND PENDING DURING

Contract Number	WORK	Number of Bids	Lowest
314	Filling area in back of sea wall near Water Street, Nantasket	11	\$ 694.40
315	Repairs at the Moody Street Dam on the Charles River in Waltham (Maintenance Work)	10	2,275.00
316	Construction of stop plank house and garage, Charles River Reservation, Lower Basin, Boston	12	21,373.00*
317	Extending and replacing sewer at Nantasket, Hull	6	6,275.80
318	Installing sluice gates, Boylston Street Bridge, Hemlock Gorge Reservation, Newton	6	4,725.00
319	Furnishing and installing certain cables, ducts, manholes fixtures, transformers etc., on the Mystic Valley Parkway, Middlesex Fells Reservation, Alewife Brook Parkway, and Revere Beach Parkway in Winchester, Medford Cambridge and Revere	7	10,682.00
320	Traffic control signals, signs and lines for the Dorchester Bay Bridge, Old Colony Parkway, Boston	2	596.00
321	Traffic control signals, signs and lines on the Old Colony Parkway at Fox Point Road, Boston	2	1,015.00
322	Drainage improvements and tide gate installation at Middlesex Fells Parkway and Mystic Valley Parkway in Medford	11	5,650.00
323	Repairs to bridge floor, draw, and drawtenders house at Malden River Bridge, Revere Beach Parkway, Medford and Everett (Maintenance Work)	12	2,319.00
324	Repairs to shelters and fence, Shirley Avenue to Oak Island Street, Revere Beach Reservation, Revere	6	8,539.30
325	Pointing rubble masonry wall along the banks of the Mystic River at Cradock Dam, Mystic Valley Parkway, Medford	9	789.00

*Third lowest bid.

†Second lowest bid.

TABLE 9

THE YEAR 1937 — PARKS DIVISION — Concluded

CONTRACTOR	Date of Contract	Date of Completion of Contract	Value of Work Done Dec. 31, 1937
Crystal Concrete Corp.	Nov. 4, 1937	Nov. 17, 1937	\$ 612.16
C. & R. Construction Co.	Nov. 10, 1937	—	—
Federal Contracting Co., Inc.	Dec. 2, 1937	—	4,150.00
M. & R. Construction Co.	Nov. 18, 1937	—	2,017.50
Vulcan Construction Co.	Nov. 18, 1937	—	—
John Williams	Dec. 16, 1937	—	—
Eagle Signal Corp.	Nov. 24, 1937	—	—
Municipal Signal & Supply Company	Nov. 24, 1937	—	—
Charles Struzziery	Nov. 24, 1937	—	—
C. W. Dolloff & Co.	Dec. 22, 1937	Dec. 27, 1937	2,319.00
West End Iron Works	Dec. 2, 1937	—	—
Maurice M. Devine, Inc.	Dec. 2, 1937	—	—

Miscellaneous Data Relative To the Development and Patronage of the Park and Recreational Facilities of the Parks Division During the Fiscal Year of 1937

PARK STRUCTURES				SPECIAL RECREATION FACILITIES			
TYPE	Total No.	No. Persons Served	Const. During 1937	TYPE	Total No.	No. Active Participants During Year	Const. During 1937
Bath Houses . . .	13	224,715	—	Athletic Fields (Track) . . .	2	7,750	—
Boat Houses . . .	5	6,580	1	Band Stands . . .	11	2,075	1
Lookout Towers . . .	4	7,380	1	Baseball Diamonds . . .	11	46,000	—
Refreshment Stands . . .	26	1,012,000	1	Bathing Beaches . . .	19	29,525,000	1
Administration Bldgs. . . .	11	—	—	Boy Scout Trails . . .	2	4,200	—
Barns	8	—	—	Bridle Trails . . .	188	25,900	—
Comfort Stations . . .	32	—	—	Children's Play-grounds . . .	10	252,000	—
Dwelling Houses . . .	27	—	—	Dance Pavilions . . .	2	3,500	—
Garages	19	—	2	Golf Courses—18 Hole . . .	2	56,384	—
Greenhouses	1	—	—	Ice Hockey Rinks . . .	2	10,000	—
Shelters	84	—	—	Ice Skating Areas . . .	21	190,000	3
Work Shops	20	—	—	Music Shells . . .	1	2,160	—
PARK DEVELOPMENT DURING 1937							
TYPE OF WORK DONE			Number				
Areas Graded (in acres)			232				
Areas Planted (in acres)			164				
Auto Parks Const. (in acres)			18½				
Bridle Trails Const. (in miles)			6				
Bulbs Planted			1,196				
Parkways Const. (in miles)			2¼				
Plants Set Out			7,015				
Roads Const. (in miles)			4½				
Sea Walls Const. (in linear feet)			753				
Shrubs Planted			8,831				
Trees Planted:							
Parkways			5,006				
Woodland			44,995				
Trees Sprayed:							
Bridle Paths (in miles)			72				
Parkways			32,990				
Roadside (in miles)			51				
Woodland (in acres)			2,350				
Trees Trimmed:							
Bridle Paths (in miles)			9				
Parkways			3,485				
Woodland (in acres)			145				
Walks Const.:							
Bituminous (in miles)			1½				
Concrete (in miles)			½				
Gravel (in miles)			5½				

**SPOT POND ZOO
MIDDLESEX FELLS RESERVATION**

Total Number of Acres	8
Number of Buildings	2
Number of Cages	33
Number of Mammals	198
Number of Birds	357
Number of Reptiles	20
Total Number of Specimens	575
Total Number of Visitors	175,000

APPENDIX No. 3

Statistics of Police Department

MISCELLANEOUS WORK DONE BY THE DEPARTMENT

Accidents reported	2,376
Assistance rendered other departments	163
Assistance rendered to U. S. Coast Guard	5
Buildings found open and made secure.	96
Cases investigated	1,091
Dead bodies found	51
Defective street lamps reported	997
Defective sidewalks reported	33
Defective streets reported	41
Fire alarms given	68
Fires extinguished without alarms	79
Injured and sick persons assisted	1,870
Insane persons cared for	19
Lost children restored	988
Rescued from drowning	85
Vessels assisted to anchorage	18
Number of cases before the courts	2,921
Cases of wayward girls and women handled without court action	65
Warnings of minor infractions of motor vehicle laws	7,457

List of Offences

Accosting and Annoying	2
Assault with intent to murder	3
Assault with dangerous weapon	7
Assault and Battery	38
Assault and Battery on a police officer	2
Attempt to rescue a prisoner	1
Assuming to be a police officer	2
Breaking and entering and larceny	6
Breaking and entering in night time	3
Breaking and entering in day time	3
Breaking and entering, attempted	6
Being present where gaming implements were found	4
Carrying concealed weapons	4
Contempt of court	1
Counterfeit money, uttering	3
Counterfeit money, possession	3
Default warrants	34
Delinquency	41
Delinquency, contributing to	2
Drunkenness	719
Disturbing peace	10
Defacing property	7
Dog, unlicensed	1
Defrauding innkeeper	1
Escape from State Institutions	3
For other police departments	24
Fugitive from Justice	1
Firearms, illegal possession of	3
Firearms, discharging on Lord's Day	3
Forgery	1
Gaming, illegal	6
Gaming on Lord's Day	6
Indecent exposure	5

Kidnapping and extortion	4
Kidnapping, S. P.	3
Larceny	37
Larceny, attempted	4
Larceny from the person	11
Larceny from the person, attempt	1
Larceny of auto	8
Lewdness	14
Lottery, setting up	5
Manslaughter	13
Medicine, unlawful practice of	1
Profanity	4
Robbery, armed	8
Robbery, unarmed	2
Robbery, S. P.	5
Rape	1
Rape, assault with intent to	1
Receiving stolen property	1
Runaways	32
Suspicious persons	12
Vagrancy	5
Violation of probation	11
Violation of parole	3
Wilfull and malicious destruction of property	12

Offences Against the Motor Vehicle Laws

Allowing another to use auto license	3
Allowing improper person to operate	8
Failing to stop at through way	3
Failing to stop for police officer	17
Failing to stop for red light	17
Failing to slow down at intersection	49
Faulty brakes	2
Failing to slow down for pedestrian	2
Failing to keep to right of road	10
Giving false name	5
Improper lights	31
Leaving scene of accident without making self known	37
Not duly licensed	88
No registration in possession	59
No license in possession	73
No registration plates	3
No certificate of inspection	69
Operating while under the influence of intoxicating liquor	206
Operating so as the lives and safety of the public might be endangered	109
Operating after revocation or suspension of license	22
Operating uninsured motor vehicle	19
Operating unregistered motor vehicle	22
Operating at a speed greater than is reasonable and proper	40
Obscure plates	3
Operating without proper registration plates	3
Obstructing road	2
Refusing to show license	2
Refusing to show registration	2
Using Motor Vehicle without authority	40

Offences against the M. D. C. Rules and Regulations

Violation M. D. C. Rules, General	161
Violation M. D. C. Rules, Auto	108
Violation M. D. C. Rules, Speeding	553

SUPERIOR COURT DISPOSITIONS

Fined	20
House of Corrections, suspended	4
Filed	19
Probation	11
House of Correction, committed	13
State Prison, committed	9
Discharged	30
Nol Prossed	16
Pending	38
State Farm, committed	1
Concord Reformatory, committed	6

DISPOSITIONS OF CASES IN THE LOWER COURTS

Appealed	133
Committed to Jail or House of Correction	61
Committed to State Farm	10
Committed to Shirley School	5
Committed to Lyman School	6
Committed to Psychopathic Hospital	7
Committed to Danvers Hospital	1
Committed to Sherborn Reformatory	2
Continued for disposition	2
Cases pending	21
Concord Reformatory, suspended	4
Dismissed	115
Defaulted	28
Drunks released	272
Discharged	49
Declined jurisdiction	2
Filed	636
Fined	1,132
Filed, cost of court	165
Fine, suspended	19
Jail or House of Correction, suspended	40
Held for Grand Jury	22
No probable cause	4
Probation	91
Suspicious persons released	14
Shirley School, suspended	6
State Farm, suspended	3
Turned over to other departments	71

FINES ASSESSED BY THE COURTS

M.D.C. Rules—General	\$334.00
M.D.C. Rules—Motor Vehicle	2,828.00
Motor Vehicle Law—Public Statute	14,684.00
General Laws	1,079.00
Drunks	1,023.00
<hr/>	
Total	\$19,948.00

APPENDIX No. 4

CONTRACTS MADE AND PENDING DURING

1 Number of Contract	2 WORK	3 Number of Bids	AMOUNT OF BID		6 Contractor
			4 Next to Lowest	5 Lowest	
111 ¹	Pumping equipment for Intermediate High Service Pumping Station in Belmont.	7 ²	\$8,990.00 ³ and guarantee of 79% efficiency.	\$8,516.00 and guarantee of 73.5% efficiency.	Turbine Equipment Co of New England, Boston.
112 ¹	Constructing a reinforced concrete covered reservoir in Arlington.	20	55,966.50	53,181.00 ⁴	O'Malley and Delaney, Waltham, Mass.
113 ¹	Constructing a masonry pumping station in Belmont.	23	18,994.00	18,000.00 ⁴	G. L. & C. Co., Boston.
114	Furnishing and laying water pipes in Everett and Chelsea.	9	217,689.75 ⁴	198,276.50	V. J. Grande Company, Boston.
117 ¹	Chlorinator at Waban Hill Reservoir.	2	2,395.00 (2% discount 10 days)	2,350.00 ⁴ (2% discount 10 days)	Hayes Pump & Machinery Co., Boston.
118 ¹	Furnishing cast-iron water pipes and special castings.	3	41,852.25	40,308.00 ⁴	Warren Pipe Company of Mass., Inc., Boston.
119 ¹	Furnishing electric-welded steel water pipes.	3	17,366.50	16,816.60 ⁴	Walsh Holyoke Steam Boiler Works, Inc., Holyoke, Mass.
120	Constructing water pipe tunnel at Malden River, Medford and Everett.	8	110,325.00	108,125.00 ⁴	V. Barletta Co., Boston.

APPENDIX No. 4

THE YEAR 1937 — WATER DIVISION

7	8	Prices of Principal Items of Contract	10 Value of Work done Dec. 31, 1937
Date of Contract	Date of Completion of Contract		
June 16, 1936	Sept. 13, 1937	See Annual Report for 1936.	\$8,990.00
July 21, 1936	May 28, 1937	See Annual Report for 1936.	60,085.53
Oct. 14, 1936	Nov. 5, 1937	See Annual Report for 1936.	18,508.71
Oct. 14, 1936	—	See Annual Report for 1936.	274,574.35
Nov. 2, 1936	Mar. 29, 1937	See Annual Report for 1936.	2,350.00
May 10, 1937	Sept. 8, 1937	For all 8-inch sand spun tar coated bell and spigot water pipe, Class 150, \$1.21 per lin. ft.; for all 10-inch sand spun tar coated bell and spigot water pipe, Class 150, \$1.63 per lin. ft.; for all 6-inch, 10-inch and 12-inch pit cast tar coated bell and spigot water pipe, Class B, \$55.20 per ton of 2,000 lbs.; for all 36-inch and 48-inch, Class B, and 48-inch, Class C, pit cast tar coated bell and spigot water pipe, \$53.20 per ton of 2,000 lbs.; for all bell and spigot special castings, \$114 per ton of 2,000 lbs.; for all flanged special castings, \$155 per ton of 2,000 lbs.	42,236.30
May 10, 1937	Aug. 23, 1937	For furnishing 42-inch electric-welded steel water pipes with rolled steel flanges, \$35.78 per lin. ft.	16,748.39
Aug. 24, 1937	—	For furnishing and driving live oak piles for shaft guards and foundations of shafts, \$1 per lin. ft.; for furnishing and placing white oak timber for shaft guards, \$250 per M. ft. B.M.; for furnishing and sinking steel caissons for shafts and excavating and lining shafts, \$195 per lin. ft.; for concrete reinforced with steel beams for foundations of shafts, \$30 per cu. yd.; for excavating and lining tunnel, \$170 per lin. ft.; for Portland cement grout placed outside tunnel lining \$30 per cu. yd.; for laying 42-inch flanged steel pipe and cast-iron specials, furnished by the Commonwealth, \$4 per lin. ft.; for Portland cement concrete placed between the water pipe and masonry lining in shafts and tunnel, \$12 per cu. yd.; for Portland cement grout placed to fill all voids between concrete surrounding water pipes and tunnel lining, \$30 per cu. yd.	79,905.00

APPENDIX NO. 4

CONTRACTS MADE AND PENDING DURING

1 Number of Contract	2 WORK	3 Number of Bids	AMOUNT OF BID		6 Contractor
			4 Next to Lowest	5 Lowest	
121	Furnishing and laying water pipes in Medford and Everett.	9	\$136,021.25	\$125,515.00 ⁴	V. Barletta Co., Boston
122 ¹	Furnishing direct feed ammoniators at Weston Reservoir.	— ⁵	— ⁵	— ⁵	Wallace & Tiernan Co., Inc., Newark, N. J.
123 ¹	Resurfacing backfilled trenches in Norwood Street, Everett.	5	1,043.80	1,014.70 ⁴	Samuel J. Tomasello Corporation, Boston.
124	Furnishing water valves.	2	21,202.00 (2% discount 15 days)	20,452.00 ⁴	Cambridge Machine & Valve, Inc., Cambridge Mass.
35-M	Sale and purchase of electric energy to be developed at Wachusett Dam in Clinton.	—	— ⁵	— ⁵	New England Power Co. and ⁶ The Edison Electric Illuminating Company of Boston.
36-M	Sale and purchase of electric energy to be developed at Sudbury Dam in Southborough.	— ⁵	— ⁵	— ⁵	⁶ The Edison Electric Illuminating Company of Boston.
68-M ¹	Reconstructing Fountain Street Bridge in Framingham.	12	7,910.25	7,701.00 ⁴	John A. Gaffey and Son, Medford, Mass.
69-M ¹	New roof for Farm Pond Gatehouse in Framingham.	2	3,165.00	2,343.00 ⁴	Byron L. Moore, Framingham, Mass.
70-M ¹	Furnishing and attaching sound-absorbing tile to ceiling of the office of the Superintendent at the Wachusett Dam in Clinton.	2	356.00	210.00 ⁴	The McClay Company, Boston.
71-M ¹	Retubing horizontal return tubular boilers at Arlington and Hyde Park Pumping Stations.	4	1,890.00	1,580.00 ⁴	Kendall Boiler and Tank Company, Inc., Cambridge, Mass.

APPENDIX No. 4

THE YEAR 1937 — WATER DIVISION — Continued

7 Date of Contract	8 Date of Completion of Contract	9 Prices of Principal Items of Contract	10 Value of Work done Dec. 31, 1937
Aug. 24, 1937	—	For furnishing and laying 48-inch electric-welded steel pipe, \$18.50 per lin. ft.; for laying 6-inch and 12-inch cast-iron pipe, furnished by the Commonwealth, for air vents and blow-offs, \$3 per lin. ft.; for rock excavation above and below established grade, \$2 per cu. yd.; for earth excavation below established grade, \$1 per cu. yd.; for furnishing and placing gravel for refilling trenches and building embankments, \$1 per cu. yd. in place; for chambers for 36-inch gate valves, \$150 per chamber; for chambers for blow-off and bypass valves, \$100 per chamber; for chambers for air valves and manholes, \$50 per chamber; for concrete masonry for foundations and anchorages, \$10 per cu. yd.; for furnishing and driving spruce piles for foundations, \$0.50 per lin. ft.; for furnishing and placing Douglas fir timber for foundations, \$75 per M. ft. B. M.; for relaying granite block pavement on concrete base, \$1.60 per sq. yd.; for bituminous Macadam pavement, \$1 per sq. yd.; for granolithic sidewalks, \$1.90 per sq. yd.; for work at railroad crossing, \$2,000; for work at creek crossing, \$750.	\$64,409.47
Aug. 2, 1937	Aug. 19, 1937	For 3 direct feed ammoniators, Type MDPA, each with a capacity of 75 lbs. of ammonia per day, complete and installed, \$1,890.81.	1,915.81
Sept. 14, 1937	Oct. 6, 1937	For resurfacing of backfilled trenches, \$1.39 per sq. yd.	1,063.35
Nov. 22, 1937	—	For all 12-inch screw lift valves, \$251 per valve; 16-inch, \$293 per valve; 20-inch, \$358 per valve; 30-inch, \$1,118 per valve; 36-inch, \$1,525 per valve.	—
Mar. 1, 1929	—	Sale and purchase of all electricity generated after deduction of that used by Commission in connection with the operation of its work in Wachusett Section.	444,176.57
Mar. 1, 1929	—	Sale and purchase of all electricity generated after deduction of that used by Commission in connection with operation of its Sudbury Power Station.	259,151.21
Nov. 23, 1936	June 12, 1937	See Annual Report for 1936.	7,692.25
Nov. 28, 1936	Feb. 1, 1937	See Annual Report for 1936.	2,343.00
Dec. 23, 1936	Jan. 16, 1937	See Annual Report for 1936.	210.00
Jan. 25, 1937	Mar. 2, 1937	For removing the old tubes and furnishing and installing new tubes in the three boilers at the Arlington Pumping Station, \$990, and in the two boilers at the Hyde Park Pumping Station, \$590.	1,580.00

APPENDIX No. 4

CONTRACTS MADE AND PENDING DURING

1 Number of Contract	2 WORK	3 Number of Bids	AMOUNT OF BID		6 Contractor
			4 Next to Lowest	5 Lowest	
72-M ¹	Retubing three vertical fire tube boilers at Chestnut Hill Pumping Station No. 1 in Boston.	5	\$4,360.00	\$4,225.00 ⁴	The Hodge Boiler Works, Boston.
73-M ¹	Repairing roof of Spot Pond Pumping Station in Stoneham.	10	3,823.00	3,195.00 ⁴	John J. Hourihan, Boston.
74-M ¹	Furnishing and erecting fences for Intermediate High Service Pumping Station in Belmont and Reservoir in Arlington.	9	2,700.10	2,670.97 ⁴	West End Iron Works, Cambridge, Mass.
75-M ¹	Retubing vertical fire tube boiler No. 23 at Spot Pond Pumping Station in Stoneham.	4	1,860.00	1,684.00 ⁴	The Hodge Boiler Works, Boston.
76-M ¹	Furnishing feed water heater for Chestnut Hill Pumping Station No. 2 in Boston.	3	1,698.00	1,418.00 ⁴	The Whitlock Coil Pipe Co., West Hartford, Connecticut.
77-M	Repairing roofs of buildings at Glenwood Pipe Yard in Medford.	2	2,284.00	1,267.00 ⁴	Atlantic Roofing and Skylight Works, Boston.
78-M	Replacing stiff-leg derrick at Chestnut Hill Pipe Yard in Boston.	4	3,775.00	2,525.00 ⁴	Groisser & Shlager Iron Works, Somerville, Mass.
79-M	Repairing girder of pipe bridge over Fitchburg Division of Boston & Maine Railroad in North Cambridge.	6 ⁷	1,800.00	1,775.00 ⁸	West End Iron Works, Cambridge, Mass.
80-M	Retubing vertical fire tube boiler No. 24 at Spot Pond Pumping Station in Stoneham.	4	1,785.00	1,750.00 ⁴	The Hodge Boiler Works, Boston.

¹ Contract completed.² Five bids did not comply with specifications in all respects.³ Contract based upon this bid. Efficiency as well as price considered in awarding contract.⁴ Contract based upon this bid.⁵ Competitive bids were not received.⁶ Name changed to Boston Edison Company, July 15, 1937.⁷ Includes two alternative bids.⁸ Contract based upon this alternative bid for replacing the girder.

APPENDIX No. 4

THE YEAR 1937—WATER DIVISION—Concluded

7 Date of Contract	8 Date of Completion of Contract	9 Prices of Principal Items of Contract	10 Value of Work done Dec. 31, 1937
Feb. 1, 1937	May 13, 1937	For removing the old tubes and furnishing and installing new tubes in three of the boilers at Chestnut Hill Pumping Station No. 1, \$4,225.	\$4,225.00
Apr. 20, 1937	June 4, 1937	For repairing roofs of engine room and boiler room of the Spot Pond Pumping Station, \$3,195.	3,365.00
June 2, 1937	Sept. 11, 1937	For furnishing and erecting steel picket fence, including 4 gates, \$2.81 per lin. ft.; for furnishing and erecting galvanized steel chain link fence with extension arms carrying 3 barbed wires, including 2 gates, \$1.54 per lin. ft.	2,670.97
Aug. 3, 1937	Oct. 7, 1937	For removing the old tubes and furnishing and installing new tubes in boiler No. 23 at Spot Pond Pumping Station, \$1,684.	2,534.00
Oct. 13, 1937	Dec. 15, 1937	For the feed water heater complete, delivered at Chestnut Hill Pumping Station No. 2, \$1,418.	1,418.00
Nov. 22, 1937	-	For repairing roofs of office building and blacksmith shop building at Glenwood Pipe Yard, \$1,267.	-
Nov. 30, 1937	-	For taking down existing stiff-leg derrick and furnishing and erecting an all steel stiff-leg derrick of 10 tons capacity, \$2,525.	-
Nov. 30, 1937	-	For furnishing and erecting a complete new girder of pipe bridge over the Fitchburg Division of the Boston & Maine Railroad in North Cambridge, \$1,775.	-
Dec. 31, 1937	-	For removing the old tubes and furnishing and installing new tubes in boiler No. 24 at Spot Pond Pumping Station in Stoneham, \$1,750.	-

APPENDIX No. 5

TABLE No. 1.—*Monthly Rainfall in inches at Various Places on the Metropolitan Water Works, 1937*

	January	February	March	April	May	June	July	August	September	October	November	December	Total
Wachusett Watershed													
Princeton	5.08	2.53	3.36	5.94	3.83	4.43	2.04	4.16	3.46	4.43	8.93	3.56	51.75
Jefferson	6.22	2.29	4.22	5.35	4.63	4.42	1.67	4.98	4.49	4.72	8.54	3.54	54.87
Sterling	5.01	2.36	3.36	5.32	4.74	4.04	1.30	5.18	3.93	4.08	8.23	3.37	50.92
Boylston		5.14	2.14	3.56	5.35	3.91	4.21	2.08	4.14	3.72	4.67	8.06	3.84
Sudbury Watershed													
Sudbury Dam	4.61	2.43	3.57	4.73	3.91	4.08	1.43	5.14	3.18	3.59	6.90	3.90	47.47
Framingham	4.59	2.35	3.73	4.93	4.02	4.01	1.60	4.69	3.06	3.33	6.68	3.98	46.97
Ashland Dam	4.52	2.32	3.54	4.59	3.37	3.69	1.26	3.93	3.08	3.16	5.97	3.89	44.32
Cordaville	4.94	2.43	3.56	5.13	3.97	4.19	1.74	4.64	3.33	4.34	6.08	3.94	48.29
Lake Cochituate	4.65	2.37	3.63	5.34	3.56	3.79	1.55	4.76	3.13	3.06	6.39	4.23	46.46
Chestnut Hill Reservoir	4.07	1.55	3.67	4.84	3.00	3.26	1.06	4.60	3.71	4.48	5.24	4.15	43.63
Spot Pond	4.87	1.65	3.65	5.71	3.12	5.33	1.42	5.78	3.89	4.77	6.10	5.68	51.97
Average of All	4.88	2.22	3.62	5.20	3.81	4.22	1.56	4.73	3.54	4.06	7.01	4.01	48.86
Average, Wachusett Watershed	5.36	2.33	3.63	5.49	4.23	4.27	1.77	4.62	3.90	4.47	8.44	3.58	52.09
Average, Sudbury Watershed	4.67	2.38	3.60	4.84	3.82	4.24	1.51	4.60	3.16	3.60	6.41	3.93	46.76

TABLE No. 2.—Rainfall in Inches at Chestnut Hill Reservoir—1937

DATE	AMOUNT	DURATION	DATE	AMOUNT	DURATION
Jan. 2 . .	{ 0.80	4.00 P.M. to 4.00 P.M.	Apr. 2 . .	0.31	11.30 A.M. to 7.25 P.M.
Jan. 3 . .	{ 0.26 ¹	7.55 A.M. to 2.15 A.M.	Apr. 6 . .	0.94	2.10 A.M. to 12.30 P.M.
Jan. 7 . .	{ 0.26 ¹	5.30 A.M. to 3.30 P.M.	Apr. 9 . .	0.22	12.10 A.M. to 5.45 A.M.
Jan. 8 . .	{ 0.24 ¹	5.55 A.M. to 2.30 P.M.	Apr. 9 . .	{ 0.12	7.45 A.M. to 1.30 A.M.
Jan. 10 . .	{ 0.19	6.00 P.M. to 1.45 A.M.	Apr. 10 . .	{ 0.09	9.45 P.M. to 2.10 A.M.
Jan. 15 . .	{ 0.44	8.15 A.M. to 11.45 A.M.	Apr. 14 . .	{ 0.08	3.45 P.M. to 1.15 A.M.
Jan. 17 . .	{ 0.07	5.45 P.M. to 6.10 A.M.	Apr. 15 . .	{ 0.12	8.00 A.M. to 11.00 P.M.
Jan. 18 . .	{ 0.20 ¹	9.30 P.M. to 10.30 A.M.	Apr. 18 . .	{ 1.54 ¹	7.10 P.M. to 7.05 A.M.
Jan. 20 . .	{ 0.55	6.50 P.M. to 2.15 A.M.	Apr. 21 . .	{ 1.34	4.50 P.M. to 11.10 A.M.
Jan. 21 . .	{ 0.30	3.30 P.M. to 7.10 A.M.	Apr. 22 . .	{ 0.08	11.00 A.M. to 4.10 P.M.
Jan. 22 . .	{ 0.75	3.55 P.M. to 9.15 P.M.	Apr. 29 . .		
Jan. 25 . .	{ 0.27 ¹		Total . .	4.84	
Total . .	4.07		May 6 . .	0.04	9.10 A.M. to 10.05 A.M.
Feb. 8 . .	0.23	1.05 P.M. to 5.20 P.M.	May 8 . .	0.01	12.30 A.M. to 4.45 A.M.
Feb. 9 . .	{ 0.12	3.50 P.M. to 4.40 A.M.	May 10 . .	0.02	4.15 A.M. to 5.30 A.M.
Feb. 10 . .	{ 0.67	3.40 A.M. to 4.25 P.M.	May 13 . .	{ 0.28	10.30 P.M. to 12.30 A.M.
Feb. 14 . .	{ 0.52 ¹	2.45 A.M. to 3.30 A.M.	May 14 . .	{ 0.81	7.30 A.M. to 9.30 A.M.
Feb. 22 . .	{ 0.01	5.50 A.M. to 6.10 A.M.	May 15 . .	{ 0.14	9.30 A.M. to 10.45 P.M.
Total . .	1.55		May 17 . .	0.69	7.15 A.M. to 9.45 P.M.
Mar. 8 . .	{ 0.21	1.05 P.M. to 1.10 A.M.	May 19 . .	0.02	12.15 P.M. to 1.20 P.M.
Mar. 9 . .	{ 0.09 ²	8.10 A.M. to 3.50 P.M.	May 22 . .	{ 0.20	6.00 P.M. to 9.00 P.M.
Mar. 13 . .	{ 0.02 ²	1.10 A.M. to 4.10 A.M.	May 23 . .	{ 0.72	10.05 P.M. to 6.45 A.M.
Mar. 15 . .	{ 2.42 ¹	7.10 A.M. to 8.50 A.M.	May 27 . .	{ 0.07	10.10 A.M. to 5.40 A.M.
Mar. 16 . .	{ 0.06 ¹	6.05 P.M. to 1.50 A.M.	Total . .	3.00	
Mar. 17 . .	{ 0.08	6.30 P.M. to 11.15 P.M.	June 3 . .	{ 0.41	5.40 P.M. to 4.00 A.M.
Mar. 18 . .	{ 0.63 ¹	5.00 P.M. to 7.05 A.M.	June 4 . .	{ 0.34	6.30 P.M. to 8.45 P.M.
Mar. 20 . .	{ 0.16 ¹	6.00 A.M. to 2.30 P.M.	June 7 . .	{ 0.02	2.30 P.M. to 3.15 P.M.
Total . .	3.67		June 8 . .	{ 0.06	6.10 P.M. to 4.30 A.M.
			June 10 . .	{ 0.36	2.30 A.M. to 5.30 P.M.
			June 11 . .	{ 0.10	3.30 A.M. to 5.00 A.M.
			June 12 . .	{ 0.22	11.50 P.M. to 4.00 A.M.
			June 13 . .	{ 1.31	10.30 A.M. to 6.20 A.M.
			June 14 . .	{ 0.30	8.10 A.M. to 9.10 P.M.
			June 15 . .	{ 0.04	11.15 P.M. to 12.45 A.M.
			June 16 . .	{ 0.03	8.20 A.M. to 9.10 P.M.
			June 17 . .	{ 0.07	1.30 P.M. to 3.45 P.M.
			Total . .	3.26	

¹ Snow and rain.² Snow.

TABLE No. 2. — Rainfall in Inches at Chestnut Hill Reservoir — 1937

DATE	AMOUNT	DURATION	DATE	AMOUNT	DURATION
July 1 . .	0.03	7.10 A.M. to 10.10 A.M.	Nov. 6 . .	0.08	3.15 A.M. to 6.45 A.M.
July 3 . .	0.02	10.30 A.M. to 11.00 A.M.	Nov. 9 . .	0.10	4.20 A.M. to 7.00 A.M.
July 9 . .	0.05	5.30 P.M. to 7.15 P.M.	Nov. 13 . .	1.67	11.15 A.M. to
July 11 . .	0.18	7.15 P.M. to	Nov. 14 . .		2.30 A.M.
July 12 . .		3.00 A.M.	Nov. 15 . .	0.13	6.30 P.M. to
July 12 . .	0.18	2.40 P.M. to	Nov. 16 . .		1.20 A.M.
July 13 . .		2.30 A.M.	Nov. 19 . .	0.23	5.30 P.M. to
July 15 . .	0.37	7.30 P.M. to	Nov. 20 . .	0.18 ¹	8.50 A.M.
July 16 . .		3.30 A.M.	Nov. 21 . .		3.50 P.M.
July 16 . .	0.07	4.40 P.M. to 5.00 P.M.	Nov. 26 . .	0.01	8.15 P.M. to 9.20 P.M.
July 26 . .	0.16	8.15 P.M. to 11.30 P.M.	Nov. 28 . .	2.84	12.30 A.M. to
Total . .	1.06		Nov. 29 . .		2.30 A.M.
Aug. 1 . .	0.31	8.55 P.M. to 10.35 P.M.	Total . .	5.24	
Aug. 2 . .	0.16	6.45 P.M. to 7.45 P.M.	Dec. 6 . .	2.34	3.30 P.M. to
Aug. 9 . .	0.39	11.20 A.M. to 5.10 P.M.	Dec. 7 . .	0.02 ¹	7.10 A.M.
Aug. 10 . .	0.15	11.00 A.M. to 3.40 P.M.	Dec. 9 . .	0.10 ²	12.10 P.M. to 2.45 P.M.
Aug. 11 . .	0.19	3.50 P.M. to	Dec. 16 . .	0.32 ¹	3.30 A.M. to 10.30 A.M.
Aug. 12 . .		5.10 A.M.	Dec. 17 . .	0.48	3.15 A.M. to 9.30 A.M.
Aug. 21 . .	1.79	3.15 P.M. to	Dec. 18 . .		5.30 A.M. to
Aug. 23 . .		9.30 P.M.	Dec. 24 . .	0.61	8.10 P.M.
Aug. 26 . .	1.61	11.15 P.M. to	Dec. 25 . .		6.40 P.M. to
Aug. 27 . .		5.15 P.M.	Dec. 28 . .	0.16 ²	5.30 A.M.
Total . .	4.60		Dec. 31 . .	0.12 ²	7.10 A.M. to 5.50 P.M.
Sept. 4 . .	0.23	5.10 P.M. to 8.30 P.M.	Total . .	4.15	12.45 A.M. to 7.00 A.M.
Sept. 5 . .	1.35	2.45 A.M. to 2.30 P.M.			
Sept. 11 . .	0.33	7.30 A.M. to 9.55 P.M.			
Sept. 12 . .	1.15	1.35 A.M. to			
Sept. 14 . .		6.00 A.M.			
Sept. 17 . .	0.08	5.00 P.M. to 8.30 P.M.			
Sept. 19 . .	0.17	1.05 P.M. to 3.15 P.M.			
Sept. 28 . .	0.40	8.00 A.M. to			
Sept. 29 . .		1.10 A.M.			
Total . .	3.71				
Oct. 6 . .	0.04	1.10 A.M. to 5.50 A.M.			
Oct. 7 . .	0.01	10.30 A.M. to 11.30 A.M.			
Oct. 10 . .	0.36	10.10 A.M. to			
Oct. 11 . .		3.00 A.M.			
Oct. 13 . .	0.07	1.20 A.M. to 5.30 A.M.			
Oct. 19 . .	0.08	3.30 A.M. to 6.45 P.M.			
Oct. 20 . .	1.58	1.30 P.M. to 11.30 P.M.			
Oct. 23 . .	1.55	8.30 A.M. to 6.40 P.M.			
Oct. 27 . .	0.01	8.30 P.M. to			
Oct. 28 . .		7.00 A.M.			
Oct. 28 . .	0.64	7.30 A.M. to			
Oct. 29 . .		1.00 A.M.			
Oct. 29 . .	0.14	7.45 A.M. to			
Oct. 30 . .		3.45 A.M.			
Total . .	4.48				

¹ Snow and rain.² Snow.

Total for the year, 43.63.

TABLE No. 3.—Wachusett System—Statistics of Flow of Water, Storage and Rainfall in 1937

(Watershed above dam = 108.84 square miles, January 1–June 30, inclusive.)
(Watershed above dam = 107.69 square miles, July 1–December 31, inclusive.)

Month	Taken ¹ by Town of Clinton	Taken by City of Wor- cester	Received from Ware River Watershed	Received ² from City of Worcester Watershed	Discharged ³ into Wachusett Aqueduct	GALLONS PER DAY			Rainfall Col- lected (Inches)	Percent- age of Rainfall Col- lected				
						STORAGE ⁵		Yield per Square Mile						
						Gain	Loss							
January	—	—	32,616,000	6,871,000	75,865,000	1,645,000	948,000	219,655,000	—	258,626,000	2,339	79.0		
February	—	—	—	7,232,000	147,154,000	1,361,000	1,000,000	27,885,000	—	170,168,000	2,519	108.1		
March	—	—	—	7,690,000	132,471,000	12,342,000	1,000,000	31,867,000	—	169,990,000	1,563,000	76.9		
April	—	—	—	21,136,000	126,362,000	116,572,000	1,001,000	30,900,000	—	253,699,000	2,331,000	73.2		
May	—	—	—	—	19,055,000	109,416,000	100,007,000	1,000,000	—	442,000	190,926,000	1,754,000	74.0	
June	—	—	—	4,320,000	121,355,000	9,017,000	1,000,000	—	—	19,533,000	107,517,000	4,277	39.9	
July	—	313,000	—	—	122,196,000	4,681,000	1,000,000	—	—	92,635,000	35,555,000	330,000	33.2	
August	1,051,000	—	—	—	164,210,000	1,752,000	1,000,000	—	—	124,852,000	43,161,000	401,000	15.5	
September	985,000	—	—	—	134,267,000	1,658,000	905,000	—	—	95,397,000	42,418,000	394,000	17.5	
October	942,000	—	—	—	114,671,000	1,755,000	900,000	—	—	60,258,000	58,010,000	539,000	4.47	
November	853,000	—	—	—	85,110,000	1,730,000	900,000	164,767,000	—	249,477,000	2,317,000	8,444	47.4	
December	71,000	—	—	—	16,003,000	100,613,000	2,164,000	984,000	103,474,000	—	191,303,000	1,776,000	3,588	88.6
Total	—	—	—	—	—	—	—	—	—	—	—	52.09	28.510	54.7
Av. for Yr.	353,000	—	2,770,000	7,178,000	119,277,000	21,253,000	970,000	48,368,000	33,084,000	147,189,000	1,357,000	—	—	—

¹ For water supply of Clinton and Lancaster.² Received from City of Worcester watershed, not included in Wachusett watershed yield.³ Including 253,000 gallons per day drawn from aqueduct for supply of Westborough State Hospital.⁴ Estimated.⁵ Aggregate storage in Wachusett Reservoir and in ponds and mill reservoirs.

TABLE No. 4.—*Sudbury System—Statistics of Flow of Water, Storage and Rainfall in 1937*
(Watershed = 75.2 square miles)

Month	Water* received from Wachusett Reservoir	Water discharged through Sudbury Aqueduct	Water discharged through Weston Aqueduct	GALLONS PER DAY			Storage	Rain- fall (In- ches)	Percent- age of Rainfall Col- lected	
				Water used by Fram- ingham Water Works	Water diverted from Watershed by Sewers, etc.	Water wasted from Farm Pond				
						Gain	Loss	Total Yield of Watershed		
January	75,632,000	22,239,000 ¹	101,239,000	1,287,000	1,726,000	332,000	127,280,000	—	8,506,000	169,965,000
February	146,918,000	20,186,000	105,976,000	1,054,000	1,096,000	127,693,000	968,000	—	—	2,260,000
March	132,235,000	14,003,000	105,984,000	1,323,000	1,106,000	800,000	130,971,000	5,500,000	—	111,354,000
April	125,937,000	11,317,000 ²	105,277,000	1,273,000	1,210,000	210,000	110,580,000	33,607,000	—	127,452,000
May	109,168,000	12,035,000	110,007,000	1,277,000	894,000	55,000	81,487,000	5,855,000	—	137,517,000
June	121,093,000	15,197,000	112,730,000	1,353,000	—	54,840,000	—	3,667,000	102,442,000	1,829,000
July	121,919,000	23,648,000	115,277,000	1,565,000	110,000	—	18,416,000	—	23,600,000	59,897,000
August	163,929,000	27,890,000	122,410,000	1,687,000	94,000	—	8,219,000	—	13,074,000	13,497,000
September	134,183,000	19,850,000	114,260,000	1,393,000	140,000	—	17,137,000	—	5,877,000	9,445,000
October	114,416,000	17,739,000	111,913,000	1,306,000	361,000	—	19,232,000	—	9,506,000	12,720,000
November	84,850,000	16,520,000	111,437,000	1,270,000	727,000	—	54,233,000	2,000,000	—	26,629,000
December	100,365,000	22,452,000	103,571,000	1,313,000	1,097,000	—	129,787,000	—	13,923,000	101,337,000
Total	119,024,000	18,608,000	110,030,000	1,363,000	202,000	73,031,000	5,076,000	—	84,538,000	1,124,000
Av. for Yr.										46.76
										23.610
										50.5

* Not including 253,000 gallons per day drawn from Wachusett Aqueduct for the supply of the Westborough State Hospital, not discharged into Sudbury Reservoir.

¹ Includes 97,000 gallons per day to Lake Cochituate.

² Includes 90,000 gallons per day to Lake Cochituate.

TABLE No. 5.—Cochiluate System—Statistics of Flow of Water, Storage and Rainfall in 1937
(Watershed of Lake = 1740 square miles)

MONTH	Water received from Sudbury Aqueduct	Water diverted from Watershed Sewers, etc.	STORAGE		Total Yield of Watershed	Yield per Square Mile	Rainfall Collected (Inches)	Percent-age of Rainfall Collected
			Gain	Loss				
January	97,000	2,226,000	34,187,000	926,000	37,242,000	2,140,000	4.65	3.818
February	—	1,800,000	26,761,000	171,000	28,732,000	1,651,000	2.37	2,660
March	—	1,745,000	32,261,000	—	31,416,000	1,806,000	3.63	3.221
April	90,000	—	23,479,000	5,250,000	30,422,000	1,746,000	5.34	3.014
May	—	1,513,000	21,432,000	—	22,374,000	1,286,000	3.56	2,294
June	—	1,040,000	17,420,000	—	15,413,000	886,000	3.79	1,529
July	—	436,000	1,842,000	—	2,152,000	124,000	1.55	0.221
August	—	167,000	—	2,739,000	2,906,000	167,000	4.76	0.298
September	—	—	429,000	9,617,000	3,598,000	207,000	3.13	0.357
October	—	503,000	—	3,771,000	4,274,000	246,000	3.06	0.438
November	—	1,023,000	14,517,000	2,613,000	18,153,000	1,043,000	6.39	1.801
December	—	1,681,000	31,077,000	—	27,200,000	1,563,000	4.23	2.788
Total	16,000	1,192,000	17,656,000	1,290,000	1,532,000	46.46	22.439	48.3
Average for Year								
						18,590,000	1,068,000	

TABLE No. 6. — *Sources from which and Periods during which Water has been drawn for the Supply of the Metropolitan Water District in 1937*

From Wachusett Reservoir into the Wachusett Aqueduct

MONTH	Number of Days during which Water was Flowing	ACTUAL TIME		* Million Gallons Drawn
		Hours	Minutes	
January	17	159	50	2,351.8
February	23	277	45	4,120.3
March	23	276	47	4,106.6
April	25	252	40	3,785.6
May	25	234	10	3,391.9
June	26	249	20	3,640.6
July	26	258	18	3,788.1
August	26	348	09	5,090.5
September	25	276	00	4,033.6
October	25	243	35	3,554.8
November	24	175	20	2,553.3
December	24	214	45	3,119.0
Totals	289	123.61 days		43,536.1

* Including quantity supplied Westborough State Hospital.

From Sudbury Reservoir through the Weston Aqueduct to Weston Reservoir

MONTH	Number of Days during which Water was Flowing	ACTUAL TIME		* Million Gallons Drawn
		Hours	Minutes	
January	31	744	00	5,138.4
February	28	666	15	2,967.4
March	31	740	00	3,285.5
April	30	718	21	3,158.3
May	31	739	00	3,410.2
June	30	718	40	3,381.9
July	31	741	35	3,573.6
August	31	737	15	3,794.7
September	30	718	10	3,427.8
October	31	739	30	3,469.3
November	30	709	25	3,343.1
December	31	744	00	3,210.7
Totals	365	363.17 days		40,160.9

From Framingham Reservoir No. 3 through Sudbury Aqueduct to Chestnut Hill Reservoir

MONTH	Number of Days during which Water was Flowing	ACTUAL TIME		* Million Gallons Drawn
		Hours	Minutes	
January	31	716	15	686.4
February	28	672	00	565.2
March	31	744	00	434.1
April	30	695*	00	336.8
May	31	744	00	373.1
June	30	720	00	455.9
July	31	744	00	733.1
August	31	744	00	864.6
September	30	721*	00	595.5
October	31	744	00	549.9
November	30	720	00	495.6
December	31	744	00	696.0
Totals	365	362.84 days		6,786.2

* Daylight saving change.

TABLE No. 7. — *Average Daily Quantity of Water flowing through Aqueducts in 1937 by Months*

MONTH	Wachusett Aqueduct into Sudbury Reservoir (Gallons)	Weston Aqueduct into Metropolitan District (Gallons)	Sudbury Aqueduct into Chestnut Hill Reservoir (Gallons)	Cochituate Aqueduct into Chestnut Hill Reservoir (Gallons)
January	75,632,000	101,239,000	22,142,000	—
February	146,918,000	105,979,000	20,186,000	—
March	132,235,000	105,984,000	14,003,000	—
April	125,957,000	105,277,000	11,227,000	—
May	109,168,000	110,007,000	12,035,000	—
June	121,093,000	112,730,000	15,197,000	—
July	121,919,000	115,277,000	23,648,000	—
August	163,929,000	122,410,000	27,890,000	—
September	134,183,000	114,260,000	19,850,000	—
October	114,416,000	111,913,000	17,739,000	—
November	84,850,000	111,437,000	16,520,000	—
December	100,365,000	103,571,000	22,452,000	—
Average	119,024,000	110,030,000	18,592,000	—

TABLE No. 8.—(Meter Basis). Average Daily Consumption of Water by Districts in the Cities and Towns supplied by the Metropolitan Water Works in 1937

MONTH	LOW SERVICE	SOUTHERN HIGH SERVICE	INTERMEDIATE HIGH SERVICE	NORTHERN HIGH SERVICE	SOUTHERN EXTRA HIGH SERVICE	NORTHERN EXTRA HIGH SERVICE	Total District Supplied (Gallons)	Estimated Population	Consumption per Inhabitant (Gallons)
		Portions of Arlington, Belmont, Boston, Chelsea, Everett, Malden, Medford, Somerville and Watertown (Gallons)	Quincy and Portions of Boston, Milton and Watertown (Gallons)	Melrose, Nahant, Revere, Stoneham, Swampscott and Winthrop and Portions of Boston, Chelsea, Everett, Malden, Medford and Somerville (Gallons)	Portions of Belmont and Watertown (Gallons)	Lexington and Portions of Boston and Milton (Gallons)			
January	70 669,300	46,168,200	1,596,100	11,685,400	1,656,500	1,916,300	133,691,800	1,451,340	92
February	68,774,800	44,694,600	1,397,000	11,276,100	1,619,800	1,860,600	129,622,900	1,452,150	89
March	65,168,800	42,943,200	1,385,700	1,354,400	1,608,300	1,857,500	124,317,900	1,452,960	86
April	62,348,700	41,908,400	1,390,100	1,154,300	1,665,700	1,848,500	120,315,700	1,453,780	83
May	62,092,200	42,623,100	1,475,900	11,733,800	1,853,500	2,104,200	121,882,700	1,455,590	84
June	67,061,000	44,434,300	1,326,500	12,706,700	1,941,700	2,360,100	129,830,300	1,455,400	89
July	72,174,500	47,866,800	1,354,900	14,614,300	2,249,300	3,063,200	141,323,000	1,456,210	97
August	74,565,600	49,786,300	1,116,800	14,656,100	2,262,600	2,746,500	145,133,900	1,457,020	100
September	69,580,900	46,340,600	1,096,600	13,691,500	2,087,700	2,268,100	135,065,400	1,457,840	93
October	67,461,400	44,350,600	1,044,300	13,012,600	1,996,700	2,241,800	130,107,400	1,458,650	89
November	66,385,500	43,678,400	1,010,100	12,223,900	1,862,700	2,195,500	127,356,100	1,459,460	87
December	68,846,300	45,153,400	1,021,900	12,195,000	1,652,800	2,104,700	130,974,100	1,460,270	90
For the year	67,938,000	45,007,900	1,267,600	12,536,400	1,873,400	2,217,300	130,840,600	1,456,210	90

TABLE No. 9.—(Meter Basis). Average Daily Consumption of Water in Cities and Towns supplied by the Metropolitan Water Works in 1937

City or town	ARLINGTON		BELMONT		BOSTON		CHELSEA		EVERETT		LEXINGTON		MALDEN	
	Population	39,830	26,450	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons
Month	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita
January	2,167,800	55	1,437,800	55	92,514,300	111	2,853,900	69	4,416,200	95	548,900	48	3,694,200	65
February	2,076,900	52	1,255,900	48	89,372,200	107	2,842,000	69	4,459,700	95	541,400	48	3,577,000	63
March	2,074,200	52	1,248,000	48	84,107,800	101	2,979,900	72	4,402,000	94	523,800	46	3,586,100	63
April	2,067,800	52	1,215,600	46	81,229,700	97	2,896,400	70	4,176,300	89	536,500	47	3,457,100	61
May	2,274,100	57	1,308,900	50	81,293,600	97	2,881,300	70	4,423,200	95	613,900	54	3,617,900	64
June	2,553,900	64	1,354,500	51	85,411,700	102	3,027,700	74	5,935,200	127	630,300	55	3,821,000	67
July	3,054,200	77	1,861,900	70	92,656,200	111	3,197,500	78	5,199,100	112	962,200	84	4,167,500	73
August	2,695,400	68	1,700,200	64	96,703,300	115	3,275,700	80	5,578,400	120	902,100	78	4,375,800	77
September	2,433,700	61	1,409,400	53	90,796,000	108	3,294,000	81	5,080,600	109	653,000	56	4,457,500	78
October	2,402,400	60	1,334,700	50	87,334,200	104	3,148,700	77	4,791,700	103	636,700	55	4,444,200	78
November	2,387,600	60	1,291,400	48	86,007,300	102	3,011,900	74	4,537,600	98	617,400	53	4,171,900	73
December	2,292,000	57	1,251,600	47	90,134,500	107	2,944,300	72	4,471,400	96	650,600	56	4,012,300	71
For the year	2,375,900	60	1,391,300	53	88,144,700	105	3,030,700	74	4,790,400	103	652,700	57	3,951,300	69

TABLE No. 9.—Continued—(Meter Basis). Average Daily Consumption of Water in Cities and Towns, etc.

City or town	Population	MEDFORD		MELROSE		MILTON		NAHANT		QUINCY		REVERE		
		Gallons	Per Capita	Gallons	Per Capita	Gallons	Per Capita	Gallons	Per Capita	Gallons	Per Capita	Gallons	Per Capita	
January	3,140,700	51	1,561,200	63	956,500	51	166,800	93	4,864,700	62	1,782,600	51	51	
February	3,154,300	51	1,398,900	57	943,400	50	158,400	88	4,913,200	62	1,886,000	54	54	
March	3,177,400	51	1,309,300	53	958,200	51	163,800	92	4,906,800	62	1,903,000	54	54	
April	3,062,300	49	1,259,400	51	944,100	50	176,200	98	4,856,500	61	1,923,600	55	55	
May	3,137,600	50	1,326,500	53	1,049,400	55	197,600	110	4,962,100	63	2,002,500	57	57	
June	3,175,700	51	1,382,000	56	1,101,600	58	262,900	146	5,030,700	63	2,487,500	71	71	
July	3,391,000	54	1,621,600	65	1,405,900	74	376,500	209	5,108,700	64	2,959,000	84	84	
August	3,399,700	54	1,626,800	65	1,329,100	70	353,600	196	4,752,500	60	2,876,700	82	82	
September	3,228,800	52	1,526,100	61	979,900	51	262,800	145	4,164,300	52	2,405,000	68	68	
October	3,221,300	52	1,554,100	62	1,011,200	53	221,000	122	4,050,700	51	2,279,600	65	65	
November	3,216,200	51	1,426,000	57	919,100	48	175,500	97	4,002,300	50	2,180,300	62	62	
December	3,218,300	51	1,403,100	56	904,200	47	204,500	113	3,942,500	49	2,076,300	59	59	
For the year	.	3,211,200	52	1,450,600	58	1,043,300	55	227,300	126	4,628,500	58	2,232,800	64	64

TABLE No. 9.—Concluded—(Meter Basis). Average Daily Consumption of Water in Cities and Towns, etc.

City or town	SOMERVILLE		STONEHAM		SWAMPSCOTT		WATERTOWN		WINTHROP		METROPOLITAN DISTRICT	
	Population	99,110	11,250	10,550				36,320		17,070		1,456,210
Month	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons	Gallons
	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita	Per Day	Per Capita
January	9,290,900	93	608,200	54	622,800	59	1,992,000	55	1,072,300	63	133,691,800	92
February	8,856,400	89	571,800	51	617,100	59	1,948,700	54	1,046,600	61	129,622,900	89
March	8,785,100	88	568,200	51	606,700	58	1,966,400	54	1,051,200	62	124,317,900	86
April	8,336,300	84	572,900	51	604,100	57	1,944,300	54	1,056,600	62	120,315,700	83
May	8,298,100	84	602,600	54	704,200	67	2,007,700	55	1,181,500	69	121,882,700	84
June	8,936,800	90	613,500	55	795,000	75	2,041,100	56	1,269,200	74	129,830,300	89
July	9,745,600	98	722,100	64	1,101,200	104	2,236,500	62	1,556,300	91	141,323,000	97
August	10,054,500	101	685,000	61	1,014,200	96	2,278,100	63	1,532,800	90	145,133,900	100
September	9,307,000	94	642,200	57	818,400	78	2,325,000	64	1,281,700	75	135,065,400	93
October	8,940,700	90	627,300	56	698,000	66	2,290,600	63	1,120,300	66	130,107,400	89
November	9,111,300	92	637,800	56	509,200	48	2,063,200	56	1,100,100	64	127,356,100	87
December	9,226,700	93	618,800	55	517,000	49	2,003,400	55	1,102,600	64	130,974,100	90
For the year	9,077,600	92	623,000	55	718,500	68	2,091,800	58	1,199,000	70	130,840,600	90

TABLE No. 10 — *Chemical Examinations of Water from the Wachusett Reservoir, Clinton, in 1937*
(Parts per 1,000,000)

DATE OF COLLECTION	APPEARANCE	TURBIDITY	ODOR	COLD		HOT		AMMONIA FREE	ALBUMINOID	HYDROGEN ION CONCENTRATION	MANGANESE	CHLORINE	HARDNESS						
				RESIDUE ON EVAPORATION		LOSS ON LIQUIDATION													
				TOTAL	LOSS ON EVAPORATION	TOTAL	LOSS ON LIQUIDATION												
Jan. 5	...	V. slight	V. faintly vegetable	—	—	.004	.076	—	—	2.4	14	—	—						
Jan. 19	...	V. slight	V. faintly vegetable	35	14	.006	.078	—	—	2.5	—	.02	2.4						
Feb. 2	...	V. slight	V. faintly vegetable	—	—	.006	.086	—	—	.01	13	.01	2.8						
Feb. 16	...	V. slight	Faintly vegetable	38	16	.002	.070	—	—	2.2	—	—	2.2						
Mar. 16	...	V. slight	V. faintly vegetable	—	—	.004	.072	—	—	2.5	14	—	—						
Mar. 30	...	V. slight	Faintly vegetable	34	13	.004	.068	—	—	—	—	—	2.2						
Apr. 6	...	V. slight	V. faintly vegetable	—	—	.000	.094	—	—	—	—	—	2.8						
Apr. 20	...	V. slight	V. faintly vegetable	36	13	.002	.094	—	—	.00	—	.00	2.4						
May 4	...	V. slight	V. faintly vegetable	—	—	.008	.090	—	—	—	—	—	2.4						
May 18	...	V. slight	V. faintly vegetable	42	19	.024	.072	6.9	1	.01	16	.01	2.2						
June 1	...	V. slight	V. faintly vegetable	—	—	.008	.098	—	—	—	—	—	3.2						
June 22	...	V. slight	V. faintly vegetable	33	14	.012	.052	—	—	—	—	—	2.5						
July 6	...	V. slight	Slight	—	—	.024	.146	—	—	—	—	—	2.6						
July 20	...	V. slight	V. faintly vegetable	37	14	.018	.144	—	—	—	—	—	2.8						
Aug. 3	...	V. slight	V. faintly vegetable	—	—	.004	.094	—	—	—	—	—	2.2						
Aug. 17	...	V. slight	V. faintly vegetable	34	12	.008	.118	—	—	—	—	—	2.4						
Sept. 7	...	V. slight	V. faintly vegetable	—	—	.008	.064	—	—	—	—	—	2.6						
Sept. 21	...	V. slight	Slight	—	—	.008	.118	—	—	—	—	—	2.6						
Oct. 5	...	V. slight	V. faintly vegetable	34	12	.008	.106	—	—	—	—	—	2.6						
Oct. 19	...	V. slight	V. faintly vegetable	39	14	.006	.070	—	—	—	—	—	2.8						
Nov. 2	...	V. slight	V. faintly vegetable	—	—	.000	.066	—	—	.00	—	—	2.6						
Dec. 7	...	V. slight	V. faintly vegetable	34	15	.008	.108	7.0	1	—	13	—	2.8						
Dec. 20	...	V. slight	Faintly vegetable	—	—	.012	.124	—	—	—	—	—	2.6						
AVERAGE				36	14	.008	.091	6.9	.01	2.6	15	—	—						

Wachusett Reservoir, entrance to aqueduct.

TABLE No. 11.—*Chemical Examinations of Water from the Sudbury Reservoir in 1937*
(Parts per 1,000,000)

DATE OF COLLECTION	APPEARANCE	TURBIDITY	SEDIMENT	ODOR		AMMONIA		MANGANESE	CHLORINE	HARDNESS
				COLD	HOT	RESIDUE ON EVAPORATION	FREE			
JAN. 5 .	V. slight	V. slight	V. faintly vegetable			.008	.106	—	.02	3.2
Feb. 2 .	V. slight	V. slight	V. faintly vegetable			.012	.108	—	—	20
Mar. 16 .	Slight	V. slight	V. faintly vegetable			.004	.100	6.9 ¹	—	3.0
APR. 6 .	V. slight	V. slight	V. faintly vegetable			.000	.110	—	—	3.2
MAY 5 .	V. slight	V. slight	Faintly vegetable			.014	.204	7.0 ¹	.00	3.4
JUNE 1 .	V. slight	V. slight	Faintly vegetable			.006	.124	—	—	3.6
JULY 6 .	V. slight	V. slight	Faintly vegetable			.006	.168	—	—	3.2
AUG. 3 .	V. slight	Slight	V. faintly vegetable			.006	.138	—	—	3.5
SEPT. 7 .	V. slight	V. slight	Faintly vegetable			.002	.120	7.3 ¹	—	18
OCT. 6 .	V. slight	V. slight	Faintly vegetable			.008	.142	—	—	2.8
NOV. 2 .	V. slight	V. slight	Faintly vegetable			.002	.086	—	.00	2.6
DEC. 7 .	V. slight	V. slight	Faintly vegetable			.012	.116	6.9 ¹	—	3.0
Average .	.....	.....	.....	.....	.....	40	15	.007	.127	7.0
									.01	3.1
										18

¹ Sudbury Reservoir, influent Weston Aqueduct.TABLE No. 12.—*Chemical Examinations of Water from Spot Pond, Stoneham, in 1937*
(Parts per 1,000,000)

JAN. 4 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	V. faintly vegetable	—	35	10	.006	.114	—	—	4.0
Feb. 1 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	Faintly vegetable	—	—	—	.002	.136	.02	.02	3.8
MAR. 15 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	V. faintly vegetable	—	37	12	.002	.092	6.9 ¹	—	3.8
APR. 5 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	V. faintly vegetable	—	—	—	.000	.130	—	—	3.8
MAY 3 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	V. faintly vegetable	—	—	—	.006	.126	.00	.00	3.8
JUNE 1 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	V. faintly vegetable	—	42	17	.004	.114	6.9 ¹	—	3.9
JULY 6 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	Faintly vegetable	—	—	—	.014	.092	—	—	3.8
AUG. 2 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	Faintly vegetable	—	37	15	.002	.082	—	—	4.0
SEPT. 7 .	V. slight	Slight	V. faintly vegetable	V. faintly vegetable	Faintly vegetable	—	—	—	.006	.120	7.4 ¹	—	3.6
OCT. 4 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	Faintly vegetable	—	36	10	.004	.096	—	—	3.8
NOV. 1 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	Faintly vegetable	—	38	12	.014	.086	.02	.02	4.0
DEC. 6 .	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	Faintly vegetable	—	—	—	.020	.122	6.9 ¹	—	4.0
Average .	.....	.....	.....	.....	.....	38	13	.007	.109	7.0	.01	.01	3.9
													18

¹ Spot Pond, east gatehouse.

TABLE No. 13.—*Chemical Examinations of Water from Lake Cochituate in 1937*
(Parts per 1,000,000)

DATE OF COLLECTION	APPEARANCE	Turbidity	Sediment	Odor		RESIDUE ON EVAPORATION	AMMONIA	Hydrogen-ion Concentration	Manganese	Chlorine	Hardness
				Cold	Hot						
Jan. 6	•	V. slight	V. slight	V. faintly vegetable	Paintly vegetable	73	.22	.172	—	8.2	31
Feb. 3	•	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	—	.240	.162	.11	8.0	—
Mar. 17	•	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	68	.16	.228	—	7.6	29
Apr. 7	•	V. slight	V. slight	Faintly vegetable	Faintly unpleasant	—	.234	.150	—	8.0	—
June 2	•	V. slight	V. slight	Faintly vegetable	Faintly vegetable	76	.24	.076	.174	—	7.4
Aug. 4	•	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	—	.004	.178	7.4	—	31
Oct. 6	•	V. slight	V. slight	Faintly vegetable	Faintly vegetable	72	.21	.002	.196	—	7.7
Nov. 3	•	Slight	Slight	V. faintly vegetable	Faintly vegetable	—	.000	.172	—	.05	33
Dec. 8	•	Slight	Slight	Faintly vegetable	Faintly vegetable	75	.25	.004	.134	—	7.8
Average				.....		73	.22	.106	.166	.08	31
				.....		73	.22	.162	—	7.9	31

TABLE No. 14.—*Chemical Examinations of Water from a Tap at the State House, Boston, in 1937*
(Parts per 1,000,000)

Jan. 5	•	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	—	.42	12	.008	.098	—	4.0
Feb. 2	•	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	—	—	—	.006	.106	.03	3.8
Mar. 18	•	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	37	—	14	.004	.086	—	—
Apr. 7	•	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	—	—	—	.002	.094	—	4.0
May 4	•	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	—	—	—	.004	.098	—	—
*July 7	•	None	V. slight	V. faintly vegetable	None	—	—	—	.002	.052	6.6	—
Aug. 5	•	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	47	—	13	.002	.088	—	4.1
Sept. 13	•	V. slight	Slight	V. faintly vegetable	V. faintly vegetable	—	—	—	.052	.144	—	4.2
Oct. 14	•	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	36	—	15	.094	.084	—	4.0
Nov. 4	•	V. slight	V. slight	V. faintly vegetable	V. faintly vegetable	—	—	—	.112	.096	—	3.8
Dec. 17	•	V. slight	V. slight	V. faintly vegetable	Faintly vegetable	43	—	14	.170	.082	—	4.0
Average				.....		41	—	14	.041	.093	6.6	—
				.....		41	—	14	.041	.093	6.6	—

* Filtered.

TABLE No. 15.—*Chemical Examinations of Water from a Faucet in Boston, 1898–1937*
(Parts per 1,000,000)

YEAR	COLOR	RESIDUE ON EVAPORATION		AMMONIA			Chlorine	Oxygen Consumed	Hardness	
		Platinum Standard	Total	Loss on Ignition	ALBUMINOID					
					Free	Total	Dissolved	Suspended		
1898	40	41.9	16.0	.008	.152	.136	.016	2.9	14	
1899	28	37.0	13.0	.006	.136	.122	.014	2.4	11	
1900	29	38.0	12.0	.012	.157	.139	.018	2.5	13	
1901	29	44.3	16.4	.013	.158	.142	.016	3.0	17	
1902	30	39.3	15.6	.016	.139	.119	.020	2.9	17	
1903	29	39.8	15.0	.013	.125	.110	.015	3.0	15	
1904	23	39.3	15.9	.023	.139	.121	.018	3.4	15	
1905	24	38.6	15.9	.020	.145	.124	.021	3.5	14	
1906	24	38.6	13.9	.018	.159	.134	.025	3.4	13	
1907	22	38.3	14.0	.013	.129	.109	.020	3.3	13	
1908	19	35.0	13.5	.011	.115	.092	.024	3.3	12	
1909	18	34.6	14.3	.011	.128	.103	.025	2.8	13	
1910	14	30.5	12.4	.013	.118	.102	.016	2.8	11	
1911	25	41.8	16.6	.015	.156	.128	.029	3.8	14	
1912	17	38.6	12.3	.018	.154	.119	.034	3.6	17	
1913	13	39.6	11.5	.014	.150	.120	.026	3.5	15	
1914	14	41.2	11.9	.014	.138	.116	.022	3.9	14	
1915	16	37.3	10.4	.015	.157	.134	.023	3.8	14	
1916	18	45.3	18.5	.013	.133	.107	.026	3.6	14	
1917	15	44.5	16.8	.015	.142	.124	.018	3.3	13	
1918	18	38.9	14.5	.019	.154	.128	.026	2.9	14	
1919	20	42.8	14.1	.010	.130	.108	.022	3.6	15	
1920	17	42.3	13.5	.012	.112	.097	.014	3.3	15	
1921	13	38.0	13.9	.006	.104	.089	.015	2.5	14	
1922	16	39.8	15.5	.011	.097	.080	.017	3.0	18	
1923	15	39.0	14.5	.011	.100	.090	.010	2.6	15	
1924	12	41.0	16.0	.011	.109	.084	.025	2.8	15	
1925	9	39.8	16.2	.013	.109	.093	.016	2.9	15	
1926	10	41.8	16.8	.015	.115	.092	.023	3.2	15	
1927	22	44.7	16.2	.013	.111	.101	.018	3.4	19	
1928	27	44.3	17.2	.011	.124	.106	.018	3.7	15	
1929	21	42.6	17.1	.007	.106	.074	.032	3.0	13	
1930	16	40.7	13.4	.012	.071	.055	.016	3.4	13	
1931	24	48.8	16.4	.013	.097	.072	.025	4.5	20	
1932	19	43.5	16.0	.007	.102	.075	.027	3.9	16	
1933	19	41.5	14.1	.010	.095	.069	.026	4.0	19	
1934	19	40.3	13.8	.013	.083	.062	.021	3.8	19	

YEAR	COLOR	RESIDUE ON EVAPORATION		Free Ammonia	Total Albumen Ammonia	Hydrogen-ion Concentration	Manganese	Chlorine	Alkalinity	Hardness							
		Platinum Standard	Total														
1935	17	42.9	15.6	.027	.095	6.7	.025	4.0	—	17							
1936	15	37.8	12.8	.009	.099	6.8	.020	3.9	—	18							
1937	19	41.0	13.8	.041	.093	6.6	.020	4.0	—	18							

TABLE No. 16.—Number of Bacteria per Cubic Centimeter in Water at Various Places on the Metropolitan Water Works, 1898–1937.
(Averages of Weekly Determinations.)

YEAR	CHESTNUT HILL RESERVOIR			SOUTHERN SERVICE TAPS	
	Sudbury Aqueduct Terminal Chamber	Cochituate Aqueduct	Effluent Gate House No. 2	Low Service 182 Boylston Street, Boston	High Service 20 Somerset Street, Boston
1898	207	145	111	96	—
1899	224	104	217	117	123
1900	248	113	256	188	181
1901	225	149	169	162	168
1902	203	168	121	164	246
1903	76	120	96	126	243
1904	347	172	220	176	355
1905	495	396	489	231	442
1906	231	145	246	154	261
1907	147	246	118	130	176
1908	162	138	137	136	148
1909	198	229	119	150	195
1910	216	—	180	178	213
1911	205	204	151	175	197
1912	429	450	227	249	259
1913	123	243	157	119	140
1914	288	—	252	174	220
1915	163	—	128	117	134
1916	128	—	85	102	105
1917	178	112	119	119	141
1918	1,163	168	705	317	544
1919	92	85	100	70	84
1920	148	86	108	113	112
1921	103	—	83	92	92
1922	163	—	153	160	172
1923	229	—	178	217	230
1924	137	—	96	150	160
1925	144	251	120	155	174
1926	167	—	118	130	137
1927	119	185	70	81	101
1928	144	32	86	106	106
1929	128	—	84	130	144
1930	107	—	66	105	123
1931	82*	4*	43	80	101
1932	121*	—	63	123	147
1933	20*	—	15	40	45
1934	10*	—	26	42	31
1935	4*	—	32	35	18
1936	21*	—	56	51	59
1937	12*	—	50	90	21

* After the water was sterilized with chlorine.

TABLE No. 17.—*Colors of Water at Various Places on the Metropolitan Water Works in 1937*

(Platinum Standard)

MONTH	WACHUSETT ¹ RESERVOIR	WACHUSETT ¹ AQUE-DUCT IN-FLUENT	FRAM-INGHAM RESER-VOIR NO. 3	LAKE ¹ COCHITUATE	CHESTNUT HILL RESERVOIR	SPOT ¹ POND	FELLS RESER-VOIR	SOUTHERN SERVICE	NORTHERN SERVICE	TAP AT GLENWOOD YARD, MEDFORD, LOW SERVICE		
										Bottom near Gate House	Mid-depth near Gate House	Bottom near Gate House
January	39	35	37	14	15	15	23	24	22	—	19	12
February	34	28	30	14	15	15	23	24	24	—	16	18
March	28	23	24	16	14	15	18	17	20	—	13	19
April	37	32	29	16	16	16	24	21	20	27	29	14
May	49	46	37	16	16	16	21	20	22	26	29	13
June	68	57	41	16	16	17	30	21	22	24	25	12
July	43	37	24	17	17	18	21	21	22	25	26	12
August	37	30	20	16	17	18	18	19	20	21	23	11
September	40	24	17	15	15	17	16	15	16	17	20	11
October	45	34	20	14	14	15	16	15	16	17	20	11
November	64	51	39	15	15	15	25	17	18	18	21	12
December	40	38	40	16	16	16	33	21	23	—	19	12
Mean	44	36	30	15	16	16	23	19	20	20	23	12
										24	19	12
										—	15	12
										19	19	13

¹ Mid-depth and bottom colors are averages of bi-weekly determinations; all others are averages of weekly determinations.

TABLE No. 18.—*Temperatures of Water at Various Places on the Metropolitan Water Works in 1937*

The temperatures are taken at the same places and times as the samples for microscopic examination, the depth at place of observation from high-water mark.
[Degrees Fahrenheit]

MONTH	WACHUSETT ¹ RESERVOIR DEPTH AT PLACE OF OBSERVATION NEAR DAM 107 FEET	WACHUSETT AQUE- DUCT IN- FLUENT	SUDSBURY ¹ RESERVOIR DEPTH AT PLACE OF OBSERVATION NEAR DAM 54.5 FEET	FRAMINGHAM ¹ RESERVOIR No. 3 DEPTH AT PLACE OF OBSERVATION NEAR DAM 20.5 FEET	LAKE ¹ COCHITUATE DEPTH AT PLACE OF OBSERVATION NEAR GATE HOUSE 62.0 FEET	CHEST- NUT HILL RESER- VOIR	NORTHERN SERVICE		SOUTHERN SERVICE		NORTHERN SERVICE	
							Bottom	Mid-depth	Bottom	Mid-depth	Bottom	Mid-depth
January .	35.0	35.3	36.0	37.0	36.0	37.4	—	—	36.9	—	35.2	40.2
February .	36.2	35.7	35.9	37.9	36.8	38.5	37.5	37.7	37.9	—	38.0	40.2
March .	36.5	35.6	39.0	38.0	37.5	38.5	43.6	44.0	46.3	—	37.2	40.1
April .	40.5	39.7	43.6	44.9	44.0	46.0	50.0	46.8	46.3	42.8	36.3	40.4
May .	54.2	52.2	48.0	49.6	57.8	54.8	52.0	58.6	56.5	48.1	45.4	40.4
June .	69.6	58.6	53.9	57.2	71.3	60.8	57.8	71.3	63.5	50.8	47.1	43.3
July .	74.3	66.3	62.7	59.5	75.9	67.3	61.8	74.9	69.3	75.9	50.4	45.0
August .	77.3	65.9	60.2	58.0	76.1	69.0	65.3	76.6	74.5	72.8	50.8	43.3
September .	67.4	67.0	57.4	58.6	65.5	64.4	65.5	64.3	66.3	50.4	47.6	43.3
October .	56.8	58.1	53.9	56.0	56.6	57.5	56.4	59.0	54.8	57.4	56.5	53.3
November .	45.9	47.8	47.8	48.0	48.3	48.8	47.8	44.8	45.3	48.1	47.2	45.0
December .	35.7	35.2	40.3	37.8	38.9	40.0	—	—	38.8	—	—	—
Mean .	52.4	49.9	50.0	48.3	54.2	54.5	51.4	53.7	59.8	59.4	49.3	46.5

¹ Mid-depth and bottom temperatures are averages of bi-weekly determinations; all others are averages of weekly determinations.

TABLE No. 19.—Length of Metropolitan Water Works Main Lines and Connections and Number of Valves set in Same,
December 31, 1937

(Pipes are of cast-iron unless otherwise noted)

	Diameter of pipes in inches										Total									
	60	56	54	48	42	40	38	36	30	24		16	14	12	10	8	6			
Total length owned and operated Dec. 31, 1936 (feet)	130,179	17,634	13,486	228,682	11,733	6,887	7,274	64,091	78,375	101,572	151,261	79,764	26	29,975	724	1,964	1,210	58	924,895	
Gate Valves in same	22	2	5	12	149	10	5	6	49	46	71	107	150	1	160	22	33	28	2	800
Air Valves in same	9										99	43			10	1				689
Length laid or relaid during 1937 (feet)																				12,651
Gate Valves in same																				14
Air Valves in same																				23
Length abandoned during 1937 (feet)																				273
Gate Valves in same																				1
Air Valves in same																				1
Length owned and operated Dec. 31, 1937 (feet)	130,179	17,634	13,486	240,517	11,733	6,887	7,274	64,132	78,375	101,572	151,348	79,856	26	30,298	724	1,964	1,210	58	937,273 ¹¹	
Gate Valves in same	22	2	5	12	170	10	5	6	49	46	50	71	107	1	164	22	33	28	2	813
Air Valves in same	9										60	100	43		10	1				711

¹ Includes 2,035 feet of 76-inch concrete-lined pressure tunnel; 363 feet of 76-inch mortar-lined and concrete-covered steel pipe; 21 feet of 76-inch cast-iron pipe; 85 feet of 60-inch concrete-covered steel pipe, and 82,624 feet of 60-inch steel pipe.

² Steel pipe.

³ Includes 24,875 feet of steel pipe.

⁴ Includes 1,823 feet of steel pipe.

⁵ Includes 286 feet of steel pipe.

⁶ Includes 15,512 feet of mortar-lined and covered wrought-iron pipe and 26,650 feet of steel pipe.

⁷ Includes 55 feet of steel pipe.

⁸ Includes 33,317 feet of cement-lined cast-iron pipe and 1,151 feet of steel pipe.

⁹ Includes 1,856 feet of cement-lined cast-iron pipe.

¹⁰ Includes 627 feet of cement-lined cast-iron pipe.

¹¹ 177.51 miles.

TABLE No. 20.—Length of Metropolitan Water Works Hydrant, Blow-off and Drain Pipes, December 31, 1937
(All pipes are of cast-iron)

	DIAMETER OF PIPES IN INCHES						Total
	24	20	16	12	8	6	
Total length in use Dec. 31, 1936 (feet)							21,510
Valves in same							390
Length laid or relaid in 1937 (feet)							238
Valves in same							8
Length abandoned in 1937 (feet)							59
Valves in same							—
Total length in use Dec. 31, 1937 (feet)							21,689
Valves in same							398

4.11 miles

TABLE No. 21.—Length of Metropolitan Water Works Main Lines and Connections and Water Pipes, Four Inches in Diameter and Larger, in the Several Cities and Towns in the Metropolitan Water District, December 31, 1937

By Whom Owned	Diameter of Pipes in Inches												Totals										
	60	56	54	48	42	40	38	36	30	24	20	18	16	14	12	10	8	6	4	Feet	Miles		
Met. Water Wks.	130,179	17,634	13,486	240,517	11,733	6,887	7,274	64,132	78,375	101,572	151,348	—	79,856	26	30,298	724	1,964	1,210	58	937,273	177.51		
Arlington	—	—	—	—	—	—	—	—	—	—	—	—	2,388	—	47,666	40,534	127,489	255,923	380	474,380	89.84		
Belmont	—	—	—	41,385	15,980	9,599	—	—	—	—	—	—	317,846	—	16,066	51,315	90,463	215,616	269	373,729	70.78		
Boston	—	—	—	—	—	—	—	—	—	—	—	—	26,395	12,880	285,177	4,450	451,155	1,150,096	1,011,842	65,752	5,153,197	975.98	
Brookline	—	—	—	—	—	—	—	—	—	—	—	—	—	—	66,387	90,750	116,036	278,321	250	628,318	119.00		
Chelsea	—	—	—	—	—	—	—	—	—	—	—	—	4,675	—	6,012	43,197	36,517	161,368	—	256,286	48.54		
Everett	—	—	—	—	—	—	—	—	—	—	—	—	4,517	—	—	—	—	—	—	—	—	—	
Lexington	—	—	—	—	—	—	—	—	—	—	—	—	2,484	2,900	7,074	6,619	8,306	47,664	41,574	176,675	18,967	312,263	55.14
Malden	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4,382	—	48,111	17,843	75,790	196,820	23,303	366,249	69.37
Medford	—	—	—	—	—	—	—	—	—	—	—	—	—	—	12,759	11,142	99,966	38,493	124,900	237,716	44,251	569,227	107.81
Melrose	—	—	—	—	—	—	—	—	—	—	—	—	673	—	6,775	9,598	47,786	49,700	146,977	309,978	999	572,486	108.42
Milton	—	—	—	—	—	—	—	—	—	—	—	—	12,464	3,024	12,296	28,296	30,085	47,536	12,206	47,536	—	360,834	68.34
Nahant	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4,579	72	94,479	23,989	106,265	238,726	8,182	476,292	90.21
Newton	—	—	—	—	—	—	—	—	—	—	—	—	—	—	10,444	5,550	11,550	13,643	39,186	58,068	138,441	26.22	
Quincy	—	—	—	—	—	—	—	—	—	—	—	—	36,250	—	15,023	—	120,562	8,410	229,485	753,094	56,147	1,218,971	230.87
Revere	—	—	—	—	—	—	—	—	—	—	—	—	15,542	—	35,648	—	84,603	102,713	259,846	458,419	61,628	1,018,399	192.88
Somerville	—	—	—	—	—	—	—	—	—	—	—	—	5,577	367	10,094	7,942	136,713	97,787	111,312	199,523	15,280	349,949	66.28
Stoneham	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	584,595	110.72	
Swampscott	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	185,583	35.15	
Watertown	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5,534	172,915	32.75
Winthrop	—	—	—	—	—	—	—	—	—	—	—	—	5,151	—	—	—	—	—	—	—	—	354,033	67.05
Total feet	130,179	17,634	13,486	281,902	27,713	16,486	7,274	108,428	203,514	337,105	367,557	880,801	686,2	6,655,640	1,249,593	2,990,106	5,344,773	465,920	14,697,266	—	2783.57	—	
Total miles	24.65	3.34	2.55	53.39	5.25	3.12	1.38	20.56	31.90	38.54	63.85	0.07	105.66	15.28	510.54	236.67	566.31	1,012.27	88.24	—	2783.57	—	

TABLE No. 22.—Number of Service Pipes, Meters, Per Cent of Services Metered, Fire Services and Fire Hydrants in the Several Cities and Towns in the Metropolitan Water District, December 31, 1937.

CITY OR TOWN	Services	Meters	Per Cent of Services Metered	Services Used for Fire Purposes Only	Fire Hydrants
Arlington	7,658	7,656	99.97	33	924
Belmont	5,053	5,053	100.00	14	541
Boston	101,757	101,757	100.00	3,151	12,157
Chelsea	5,720	5,720	100.00	151	462
Everett	7,898	7,398	100.00	55	633
Lexington	2,644	2,644	100.00	17	546
Malden	9,789	9,775	99.86	75	745
Medford	10,832	10,832	100.00	36	1,110
Melrose	6,157	6,157	100.00	25	480
Milton	4,497	4,497	100.00	8	749
Nahant	918	918	100.00	2	144
Quincy	17,019	17,019	100.00	54	1,833
Revere	6,488	6,482	99.91	13	526
Somerville	13,947	13,786	98.85	132	1,426
Stoneham	2,460	2,460	100.00	3	200
Swampscott	2,785	2,785	100.00	7	292
Watertown	6,111	6,111	100.00	43	740
Winthrop	3,905	3,905	100.00	6	388
District Supplied	215,138	214,955	99.91	3,825	23,896
Brookline	8,306	8,301	99.94	53	1,191
Newton	15,787	15,787	100.00	102	1,756
Total District	239,231	239,043	99.92	3,980	26,843

TABLE No. 23.—Elevation of the Hydraulic Grade Line, in Feet, above Boston City Base for Each Month at Stations on
Metropolitan Water Works during 1937

1937 MONTH	Low Service												SOMERVILLE, PUBLIC LIBRARY, HIGHLAND AVENUE			MALDEN, WATER WORKS SHOP, GREEN STREET			CHELSEA, COURT HOUSE					
	WATERTOWN, PEASANT STREET AT WALTHAM LINE			BELMONT, WATER WORKS SHOP, WAVER- LEY STREET ¹			BOSTON, BOWDOIN SQUARE ENGINE HOUSE			ALLSTON, ENGINE HOUSE, HARVARD STREET			MEDFORD, NEAR MYSTIC RESERVOIR			SOMERVILLE, PUBLIC LIBRARY, HIGHLAND AVENUE			MALDEN, WATER WORKS SHOP, GREEN STREET			CHELSEA, COURT HOUSE		
	Maximum	Minimum	Maximum	Maximum	Minimum	Maximum	Maximum	Minimum	Maximum	Maximum	Minimum	Maximum	Maximum	Minimum	Maximum	Maximum	Minimum	Maximum	Maximum	Minimum	Maximum	Maximum	Minimum	
January	195	191	187	175	149	138	175	168	166	160	160	165	156	157	158	143	158	156	166	165	156	158	143	
February	194	191	186	175	150	137	175	170	165	160	160	164	156	156	156	158	158	156	165	165	156	158	144	
March	194	188	192	185	152	138	176	168	165	161	161	164	156	156	156	158	158	156	166	166	156	158	146	
April	195	191	192	181	150	143	175	168	165	160	160	165	156	156	156	158	158	156	166	166	157	166	125	
May	194	188	188	176	152	143	176	168	165	159	159	168	158	157	157	158	158	157	166	166	155	166	142	
June	193	183	190	175	150	136	177	170	171	162	162	167	155	155	155	158	158	153	167	167	156	165	139	
July	191	184	186	176	150	134	178	168	171	161	161	168	156	156	156	158	158	155	165	165	156	165	131	
August	193	184	192	178	150	138	177	168	170	169	169	170	162	162	162	168	168	157	166	166	153	163	137	
September	195	187	192	186	152	141	176	170	166	162	162	166	156	156	156	164	164	153	164	164	156	164	132	
October	193	186	192	186	150	141	176	170	166	161	161	167	157	157	157	164	164	155	164	164	151	158	140	
November	195	186	194	183	150	138	182	170	167	160	160	167	156	156	156	163	163	151	163	163	151	158	137	
December	194	187	191	179	150	138	177	169	168	161	161	166	156	156	156	165	165	155	166	166	156	165	138	
Averages	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

¹After July 1 located at Pleasant St., at Concord Ave.

TABLE No. 23.—Concluded—*Elevation of the Hydraulic Grade Line, in Feet, above Boston City Base, etc.*

1937 MONTH	SOUTHERN HIGH SERVICE				NORTHERN HIGH SERVICE				INTERMEDIATE HIGH SERVICE ¹		NORTHERN EXTRA HIGH SERVICE	
	BOSTON, BOWDOIN SQUARE		MILTON, ADAMS STREET AT CANTON AVENUE		QUINCY, FORBES HILL TOWER		SOMERVILLE, BROADWAY AT CEDAR ST.		REVERE, WATER WORKS SHOP, BROADWAY			
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum		
January	245	226	244	224	244	216	242	207	263	237	252	
February	245	228	247	226	244	223	242	216	263	244	252	
March	245	228	246	227	244	223	242	216	263	237	258	
April	245	228	246	227	244	224	242	216	263	242	257	
May	245	224	247	226	244	222	244	214	260	242	246	
June	245	224	248	221	245	212	245	212	260	202	240	
July	242	219	247	211	245	205	239	205	260	219	258	
August	242	215	247	211	245	207	244	202	260	214	258	
September	245	217	247	225	245	219	244	216	263	226	258	
October	245	227	248	226	246	222	244	221	265	236	257	
November	245	228	248	226	246	222	244	221	265	237	251	
December	245	228	247	225	246	222	244	221	263	230	251	
Averages	245	224	247	223	245	218	242	213	262	234	259	

New Arlington Reservoir put in service June 8.

Maximum

Minimum

APPENDIX No. 6

Information relating to areas, populations, local sewer connections and other data for the Metropolitan sewerage districts appears in the following table:

North Metropolitan Sewerage District

Area (Square Miles)	Estimated Total Population	Miles of Local Sewer Connected	Estimated Population Contributing Sewage	Ratio of Contributing Population to Total Population (Per Cent)	CONNECTIONS MADE WITH METROPOLITAN SEWERS	
					Public	Special
101.49	750,675	1,031.56	692,333	92.23	396	759

South Metropolitan Sewerage District

208.52	752,240	1,072.69	529,207	70.35	225	91
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Both Metropolitan Sewerage Districts

310.01	1,502,915	2,104.25	1,221,540	81.28	621	850
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Of the estimated gross population of 1,502,915 on December 31, 1937, 1,221,540, representing 81.28 per cent, were on that date contributing sewage to the Metropolitan sewers, through a total length of 2,104.25 miles of local sewers owned by the individual cities and towns of the districts.

These sewers are connected with the Metropolitan Systems by 621 public and 850 special connections. During the current year there has been an increase of 21.59 miles of local sewers connected with the Metropolitan Systems, and 10 public and 7 special connections have been added.

NORTH METROPOLITAN SEWERAGE SYSTEM

Location, Length and Sizes of Sewers, with Public and Special Connections

CITY OR TOWN	SIZE OF SEWERS	Length in Miles	Public Connections, December 31, 1937	SPECIAL CONNECTIONS		Number in Operation
				Character or Location of Connections added in 1937	Number in Operation	
Boston:						
Deer Island	4'0" to 9'0"	1.653	4	-	-	1
East Boston	9'0" to 1'0"	5.467	25	-	-	3
Charlestown	6'7" x 7'5" to 1'0"	3.292	15	-	-	11
Winthrop	9'0"	2.864	14	-	-	3
Chelsea	8'4" x 9'2" to 15"	5.230	14	-	-	8
Everett	8'2" x 8'10" to 4'8" x 5'1"	2.925	10	-	-	11
Lexington ¹	1'3" to 2'3"	.002	2	-	-	-
Malden	4'6" x 4'10" to 1'0"	5.844 ²	39	Continental Can Co. Private house	1 1	137 ³
Melrose	4'6" x 4'10" to 10"	6.099 ⁴	43	-	-	13
Cambridge	5'2" x 5'9" to 1'3"	7.899	58	-	-	9
Somerville	6'5" x 7'2" to 10"	3.577	16	-	-	20
Medford	8'6" x 8'6" to 10"	10.781	28	-	-	31
Winchester	5'6" x 5'9" to 15"	13.496	35	Private house	1	
Stoneham	3'0" to 10"	4.026	12	-	-	6
Woburn	4'2" x 4'5" to 15"	1.783	4	-	-	-
Arlington	3'0" x 3'6" to 10"	6.723 ⁶	67	Private house Rest rooms and Filling Station	1 1	251 ⁷
Belmont	1'3" to 2'6"	0.008	5	-	-	-
Wakefield	3'0" to 2'0" x 2'3"	0.703	1	-	-	1
Revere	4'0" to 15"	0.136	3	-	-	-
Reading	1'4" to 3'0"	0.055	1	-	-	-
		82.563 ⁸	396			759

¹The Metropolitan Sewers extend but a few feet into the town of Lexington.²Includes 1.84 miles of sewer purchased from the city of Malden.³Mostly buildings connected with sewers formerly belonging to city of Malden but later purchased by the Metropolitan Sewerage Commission in accordance with Chapter 215 of the Acts of 1898 and by the Metropolitan Water and Sewerage Board in accordance with Chapter 512 of the Acts of 1911 and made parts of the North Metropolitan Sewerage System.⁴Includes 0.736 of a mile of sewer purchased from the city of Melrose.⁵Mostly buildings connected with a sewer formerly belonging to the city of Melrose but later purchased by the Metropolitan Sewerage Commission in accordance with Chapter 414 of the Acts of 1896 and with a sewer extension built in accordance with Chapter 436 of the Acts of 1897 by the Metropolitan Sewerage Commission as an outlet for part of the town of Stoneham and made parts of the North Metropolitan Sewerage System.⁶Includes 2.631 miles of sewer purchased from the town of Arlington.⁷Mostly buildings connected with a sewer formerly belonging to the town of Arlington but later purchased by the Metropolitan Sewerage Commission in accordance with Chapter 520 of the Acts of 1897 and made a part of the North Metropolitan Sewerage System.⁸Includes 2.787 miles of Old Mystic Valley Sewer in Medford and Winchester, running parallel with the Metropolitan Sewer.

SOUTH METROPOLITAN SEWERAGE SYSTEM

Location, Length and Sizes of Sewers, with Public and Special Connections

CITY OR TOWN	SIZE OF SEWERS	Length in Miles	Public Connec- tions, Decem- ber 31, 1937	SPECIAL CONNECTIONS				Number in Operation
				Character or Location of Connections added in 1937				
Boston:								
Back Bay .	6'6" to 3'9" . . .	1.500 ¹	17	—	—	—	—	7
Brighton .	7'0" to 12" . . .	6.405 ²	16	—	—	—	—	7
Dorchester .	3' x 4' to 2'6" x 2'7" . . .	2.870 ³	14	—	—	—	—	9
Hyde Park .	10'7" x 11'7" to 30" pipe . . .	4.543	20	—	—	—	—	5
Roxbury .	6'6" x 7' to 4'0" . . .	1.430	—	—	—	—	—	—
West Roxbury	9'3" x 10'2" to 12" . . .	7.643	27	Private building, Caledonian Av.				12
Brookline .	6'6" x 7'0" to 8" . . .	2.540 ⁴	14	—	—	—	—	2
Dedham .	4' x 4'1" to 2'9" x 3" . . .	5.012	11	—	—	—	—	3
Hull ⁵ .	60" Pipe . . .	0.750	—	—	—	—	—	—
Milton .	11' x 12' to 8" . . .	7.127	39	—	—	—	—	4
Newton .	5'3" x 5'6" to 1'3" . . .	2.912	15	—	—	—	—	17
Quincy .	11'3" x 12'6" to 16" pipe . . .	8.738	31	—	—	—	—	2
Waltham .	3'6" x 4'0" . . .	0.001	1	—	—	—	—	—
Watertown .	4'2" x 4'9" to 12" . . .	0.750 ⁶	8	—	—	—	—	6
Needham .	2'0" x 2'3" to 2'3" x 2'6" . . .	4.921	1	—	—	—	—	9
Wellesley ⁷ .	2'0" x 2'3" . . .	—	1	—	—	—	—	—
Canton .	4'6" x 5'0" to 20" . . .	7.243	4	Airport Administration Bldg.				5
Norwood .	4'0" x 4'3" to 30" pipe . . .	2.844	3	—	—	—	—	1
Stoughton ⁷ .	— . . .	—	—	—	—	—	—	—
Walpole ⁷ .	— . . .	—	—	—	—	—	—	—
Braintree .	30" pipe . . .	0.071	1	—	—	—	—	—
Weymouth .	4'9" x 5'0" to 30" pipe . . .	1.346	—	—	—	—	—	—
		68.646	225					91

¹ Includes 0.355 of a mile of sewer purchased from the city of Boston.² Includes 0.446 of a mile of pipe and concrete sewers built for the use of the city of Boston; also 0.026 of a mile of sewer purchased from the town of Watertown.³ Includes 1.24 miles of sewer purchased from the city of Boston.⁴ Includes 0.158 of a mile of pipe sewer built for the use of the town of Brookline.⁵ Hull is not a part of the Metropolitan Sewerage District.⁶ Includes 0.025 of a mile of sewer purchased from the town of Watertown.⁷ The Metropolitan Sewer extends but a few feet into the towns of Wellesley, Walpole, and Stoughton.

NORTH METROPOLITAN SEWERAGE SYSTEM

Table showing Cities and Towns delivering Sewage to this System; Approximate Miles of Sewers connected; Estimated Populations and Areas now contributing; Total Areas ultimately to contribute, and Present Populations on Such Areas; Ratios of Present Contributing Areas to Ultimate Areas, and Ratios of Such Areas; Ratios of Present Contributing to Present Total Populations.

(Populations estimated as of December 31, 1937)

CITIES AND TOWNS	Miles of Local Sewers Connected	Separate or Combined	Number of Connections with Local Sewers	Estimated Number of Persons Served by Each House Connection ¹	Estimated Population Now Contributing Sewage	Estimated Present Total Population	Estimated Area Now Contributing Sewage	Area Ultimately to Contribute Sewage	Ratio of Contributing Population to Present Total Population	Per Cent	Ratio of Contributing Area to Ultimate Area
Boston (Deer Island)	0.70	Separate	3,954	4.31	825 ²	825 ²	17,100	1,44	1.61	99.65	89.44
Winthrop	33.92	Separate	5,560	11.29	62,770	66,010	1,27	2.18	95.09	58.26	
Boston (East Boston)	36.01	Separate and combined	4,575	8.74	39,990	40,680	1,23	2.07	98.30	59.42	
Chelsea	37.73	Separate and combined	7,233	6.40	46,290	46,480	2.15	2.92	99.59	73.63	
Everett	53.59	Separate and combined	5,349	5.80	56,800	56,800	3.64	4.16	99.08	87.50	
Malden	83.54	Separate	5,703	4.44	23,750	24,950	2.30	3.81	95.19	60.37	
Melrose	55.07	Separate	5,620	5.03	28,270	28,380	0.67	1.27	99.61	52.76	
Boston (Charlestown)	22.10	Separate and combined	19,289	6.26	120,750	120,870	5.27	5.43	99.90	97.05	
Cambridge	155.95	Separate and combined	18,548	5.31	98,490	98,780	3.74	3.96	99.71	94.44	
Somerville	115.01	Separate and combined	10,917	5.61	61,240	62,530	4.57	6.11	97.94	74.80	
Medford	101.88	Separate	3,031	4.49	13,780	13,780	2.13	5.31	98.77	40.11	
Winchester	45.67	Separate	2,069	5.47	11,320	19,860	1.42	12.23	57.00	11.61	
Woburn	29.70	Separate	1,691	4.80	8,120	11,330	1.08	4.27	71.67	25.29	
Stoneham	21.55	Separate	1,691	4.80	36,910	40,090	3.18	4.73	92.07	67.23	
Arlington	73.14	Separate	6,663	5.64	22,358 ³	27,560 ³	2.72	3.77	81.12	72.15	
Belmont	56.30	Separate	3,817	5.65	8,580	16,610	1.57	6.36	51.66	24.69	
Wakefield	28.30	Separate	1,772	4.84	8,580	11,660	0.98	15.98	29.50	6.13	
Lexington	18.52	Separate	4,798	4.31	3,440	3,440	2.58	5.55	85.27	46.49	
Revere	51.67	Separate	5,480	5.46	29,920	35,090	0.54	9.76	21.08	5.53	
Reading	11.21	Separate	567	4.20	2,380	11,290	42.48	101.48	92.23	46.06	
Totals	1,031.56	-	-	116,636	5.94	692,333	750,675	-	-	-	-

¹ Estimated from Assessors' statement of the number of houses in each city or town on December 31, 1937 and the population from census of 1935.² Estimated by Superintendent of the Institution on Deer Island.³ Including 2 connections with McLean Hospital, having an estimated population of 788.

SOUTH METROPOLITAN SEWERAGE SYSTEM

Table showing Cities and Towns delivering Sewage to this System; Approximate Miles of Sewers connected; Estimated Populations and Areas now contributing; Total Areas ultimately to contribute, and Present Populations on Such Areas; Ratios of Present Contributing Areas to Ultimate Areas and Ratios of Populations now contributing to Present Total Populations.
(Populations estimated as of December 31, 1937)

CITIES AND TOWNS	Miles of Local Sewers Connected	Miles of Local Sewers Connected or Combined	Number of Connections with Local Sewers	Estimated Persons Served by Each House Connection ¹	Estimated Population Now Contributing Sewage	Estimated Present Total Population	Estimated Area Now Contributing Sewage	Area Ultimately to Contribute Sewage	Ratio of Population to Present Total Population	Ratio of Contributing Area to Ultimate Area
					Sq. Miles	Sq. Miles	Sq. Miles	Sq. Miles	Per Cent	Per Cent
Boston (Back Bay)	27.84	Separate and combined	2,259	9.95	22,480	22,570	1.17	1.61	99.60	72.67
Boston (Brighton)	75.07	Separate and combined	6,052	11.74	71,050	74,570	3.41	3.74	95.28	91.18
Brookline	97.94	Separate and combined	7,750	6.67	51,690	52,100	4.68	5.35	99.21	87.48
Newton	195.70	Separate and combined	13,770	4.55	62,650	66,680	9.62	16.00	93.95	60.13
Watertown	64.07	Separate	6,155	4.40	27,080	36,410	2.97	3.83	74.38	77.55
Waltham	65.12 ⁶	Separate	5,502	4.92	29,780 ⁵	44,100 ⁵	3.65	11.38	67.53	32.07
Boston (Dorchester)	74.49	Separate and combined	8,438	8.23	69,440 ²	73,030 ²	3.04	4.89	95.08	62.17
Milton	39.40	Separate and combined	3,155	4.29	13,520 ²	19,240 ²	1.70	9.59	70.27	17.73
Boston (Hyde Park)	45.67	Separate	3,524	13.18	46,450	46,910	2.01	4.57	99.02	43.98
Dedham	1.72	Separate	1,633	4.46	7,290	15,520	1.22	9.66	46.95	12.63
Boston (Roxbury) ⁴	—	Separate and combined	—	—	—	74,500 ²	—	1.23	—	—
Boston (West Roxbury)	100.60	Separate and combined	7,982	4.93	39,350 ^{2,4}	40,170 ^{2,4}	3.91	8.92	97.96	43.83
Quincy	154.80	Separate	13,410	4.41	59,090	80,020	5.96	11.46	73.85	52.01
Wellesley	43.94	Separate	1,965	4.05	7,960	14,600	2.24	9.89	54.51	22.65
Needham	19.18	Separate	—	—	—	—	—	—	—	—
Canton	3.35	Separate	311	4.59	3,695	12,450	0.90	11.44	29.68	7.87
Norwood	32.81	Separate	2,231	6.10	13,610	15,910	1.75	17.84	20.58	0.90
Stoughton	5.72	Separate	102	4.33	442	8,650	0.07	16.23	85.54	17.22
Walpole	7.69	Separate	—	—	500 ⁷	7,560	0.28	20.76	5.11	0.43
Braintree	17.58	Separate	394	4.32	1,700	18,010	0.82	13.44	6.58	1.35
Weymouth	—	Separate	—	—	—	22,300	—	16.46	9.46	6.10
Totals	1,072.69	—	85,626	6.18	529,207	752,240	49.56	208.45	70.35	23.78

¹ Estimated from Assessors' statement of the number of houses in each city or town on December 31, 1937 and the population from census of 1935.

² Parts of Dorchester, Milton, Roxbury and West Roxbury which are situated within the South Metropolitan Sewerage District limits are tributary at present to Boston main drainage works.

³ At present connected with the Boston main drainage system.

⁴ Including connections with the Metropolitan State Hospital and the Middlesex County Tuberculosis Hospital, authorized by chapter 372 of the Acts of 1928 and chapter 373 of the Acts of 1929, having an estimated population of 3,065.

⁵ Including connections with the Metropolitan State Hospital and the Middlesex County Tuberculosis Hospital, authorized by chapter 372 of the Acts of 1928 and chapter 373 of the Acts of 1929, having an estimated population of 2,710.

⁶ Includes 3.65 miles of trunk sewer built by Waltham for the joint use of Waltham, Watertown, Metropolitan State Hospital, and Middlesex County Tuberculosis Hospital, authorized by Chapter 372 of the Acts of 1928 and Chapter 373 of the Acts of 1929.

⁷ Includes 4 manufacturing plants.

Both METROPOLITAN SEWERAGE SYSTEMS
Table showing Areas delivering Sewage to both Systems; Approximate Miles of Sewers connected; Estimated Populations and Areas now contributing; Total Areas ultimately to contribute, and Present Populations on Such Areas. Ratios of Present Contributing Areas to Ultimate Areas, and Ratios of Populations now contributing to Present Total Populations.

(Populations estimated as of December 31, 1937)

Systems	Miles of Local Sewers Connected	Separate or Combined	Number of Connections with Local Sewers	Estimated Number of Persons Served by Each House Connection	Estimated Population Now Contributing Sewage	Estimated Present Total Population	Estimated Area Now Contributing Sewage	Area Ultimately to Contribute Sewage	Ratio of Contributing Population to Present Total Population	Ratio of Contributing Area to Ultimate Area	Per Cent
North Metropolitan	1,031.56	Separate and combined	116,636	5.94	692,333	750,675	42.48	101.48	92.23	46.06	
South Metropolitan	1,072.69	Separate and combined	85,626	6.18	529,207	752,240	49.56	208.45	70.35	23.78	
Totals	2,104.25	-	-	-	202,262	1,221,540	1,502,915	92.04	309.93	81.28	29.70

APPENDIX No. 7

CONTRACTS MADE AND PENDING DURING THE

Contracts relating to the

1 Number of Contract	2 WORK	3 Number of Bids	AMOUNT OF BID		6 Contractor
			4 Next to Lowest	5 Lowest	
1 73 ²	Furnishing and placing two horizontal tubular boilers at Charlestown Pumping Station, Alford Street, Boston, Mass.	7	\$2,498.00	\$2,481.00 ¹	D. M. Dillon Steam Boiler Works, Inc., Fitchburg, Mass.
2 75 ^{2*}	Section 107, Medford, Mass.	11	197,835.00	169,883.50 ¹	J. F. Fitzgerald Const. Co., 214 Essex St., Boston.
3 76 ^{2*}	Section 108, Medford, Mass.	9	180,040.00	169,220.00 ¹	C. & R. Construction Co., 75 Bradeen St., Roslindale.
4 77 ^{2*}	Section 111, Medford, Mass.	5	549,270.00	502,880.00 ¹	V. Bartletta Co., 10 Whipple Ave., Roslindale.
5 78 ^{2*}	Section 112, Medford and Winchester, Mass.	8	362,975.00	358,800.00 ¹	C. & R. Construction Co., 75 Bradeen St., Roslindale.
6 79 ^{2*}	Section 113, Winchester, Mass.	7	169,165.00	157,480.00 ¹	A. Baruffaldi Co., 52 Powder House Blvd West Somerville.
7 80 ^{2*}	Section 114, Winchester, Mass.	6	190,920.00	174,505.00 ¹	Edward M. Matz, 25 Zamora St., Jamaica Plain.
8 81 ^{2*}	Section 115A, Winchester, Woburn and Stoneham, Mass.	6	209,668.55	194,100.99 ¹	P. De Cristofaro Co., Inc., 38 Glendower Road, Roslindale.
9 82 ^{2*}	Section 115B, Stoneham, Mass.	8	166,734.05	159,578.30 ¹	C. & R. Construction Co., 75 Bradeen St., Roslindale.
10 83 ^{2*}	Section 106, Medford, Mass.	7	129,307.96	127,849.40 ¹	A. Baruffaldi Co., 52 Powder House Blvd West Somerville.
11 84 ²	Trestle for 12-inch salt-water intake pipe at Deer Island, Mass.	6	14,035.00	13,767.50 ¹	M. F. Gaddis, Inc., 6 Beacon St., Boston.
12 85	Furnishing and installing two vertical tubular boilers with corrugated iron fire boxes at East Boston Pumping Station, Addison St., East Boston, Mass.	4	12,995.00	12,840.00 ¹	D. M. Dillon Steam Boiler Works, Inc., Fitchburg, Mass.
13 88 ^{2*}	Grading and paving, in Medford, Winchester and Stoneham Mass.	7	11,305.00	11,017.50 ¹	Warren Bros. Roads Co., 38 Memorial Drive, Cambridge, Mass.
14 89	Furnishing and installing twenty-four new Sections in the Green Fuel Economizer, Deer Island Pumping Station, Boston Harbor, Mass.	1		3,562.00 ¹	Green Fuel Economizer Co., Inc., Boston, Mass.

¹ Contract based upon this bid.² Contract completed.

* P.W.A. Project No. Mass. 1098-R, D-101—North Metropolitan Relief Sewer.

APPENDIX No. 7

YEARS 1936 AND 1937 — SEWERAGE DIVISION

North Metropolitan System

7 Date of Contract	8 Date of Completion of Work	9 Prices of Principal Items of Contracts made in 1937	10 Value of Work done Dec. 31, 1937	
Oct. 31, 1935	Feb. 13, 1936	Lump sum.	\$2,481.00	1
Jan. 13, 1936	Nov. 9, 1936	See Annual Report for 1936.	222,234.50	2
Feb. 20, 1936	Apr. 26, 1937	See Annual Report for 1936.	237,063.49	3
Apr. 30, 1936	Aug. 14, 1937	See Annual Report for 1936.	528,477.20	4
Mar. 31, 1936	Oct. 13, 1937	See Annual Report for 1936.	478,210.00	5
Mar. 31, 1936	Feb. 12, 1937	See Annual Report for 1936.	170,553.70	6
Mar. 31, 1936	July 12, 1937	See Annual Report for 1936.	224,935.32	7
July 14, 1936	Sept. 14, 1937	See Annual Report for 1936.	209,372.28	8
Sept. 14, 1936	Aug. 21, 1937	See Annual Report for 1936.	169,158.51	9
Apr. 14, 1937	Oct. 19, 1937	See Canvass of Bids.	138,070.14	10
June 10, 1937	Aug. 12, 1937	For wood piles, \$1.05 per lin. ft., lumber, \$130. per M. ft. B. M., relaying 12" C. I. Pipe, \$1.40 per lin. ft., "Leadite" for pipe jointing, \$0.15 per lb., rock wool packed around pipe, \$0.03 per lb.; 500 sets of bolts, nuts and washers, \$0.30 each; 1" steam pipe, \$0.50 per lin. ft.	15,655.20	11
Aug. 5, 1937	—	Lump sum.	—	12
Oct. 6 1937	Oct. 29 1937	For exca., fill and preparation of subgrade, \$1.12 per cu. yd., earth fill, \$0.31 per cu. yd., resetting M. H. frames and covers, each \$5.00; riprap, \$3.00 per sq. yd., bituminous macadam paving, \$0.83 per sq. yd., bituminous concrete paving, \$1.50 per sq. yd., bituminous surface treatment, \$0.25 per sq. yd.; and resetting edge stone, \$0.25 per lin. ft.	11 595.73	13
Nov. 18, 1937	—	Lump sum.	—	14

APPENDIX No. 7

CONTRACTS MADE AND PENDING DURING
Contracts relating to the

1 Number of Contract	2 WORK	3 Number of Bids	AMOUNT OF BID		6 Contractor
			4 Next to Lowest	5 Lowest	
1 74 ²	Furnishing and installing, with smoke flue connections, two vertical tubular boilers at the Nut Island Station, Quincy, Mass.	4	\$5,970.00	\$5,345.00 ¹	D. M. Dillon Steam Boiler Works, Inc., Fitchburg, Mass.

¹ Contract based upon this bid.² Contract completed.

Summary of Contracts

		Value of Work done Dec. 31, 1937
North Metropolitan System, 14 Contracts	· · · · · · · · · · · · · ·	\$2,407,807.07
South Metropolitan System, 1 Contract	· · · · · · · · · · · · · ·	5,345.00
Total of 15 contracts made and pending during the years 1936 and 1937	· · · · · · · · · · · · · ·	\$2,413,152.07

APPENDIX No. 7

THE YEARS 1936 AND 1937 -- SEWERAGE DIVISION — Concluded

South Metropolitan System

7 Date of Contract	8 Date of Completion of Work	9 Prices of Principal Items of Contracts made in 1937	10 Value of Work done Dec. 31, 1937	
Nov. 27, 1935	Sept. 28, 1936	Lump sum.	\$5,345.00	1

